THE UNIVERSITY OF ALBERTA

CALIFORNIA PSYCHOLOGICAL INVENTORY
PERSONALITY FACTORS IN SUCCESS OF SALESMEN

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

DEPARTMENT OF PSYCHOLOGY

EDMONTON, ALBERTA

AUGUST, 1962

ABSTRACT

This study was concerned with investigating the value of the California Psychological Inventory (CPI) in distinguishing between successful and unsuccessful salesmen. It was hypothesized that there would be a significant difference in the means of the two groups favoring the successful salesmen on those CPI scales which measure attributes related to social behavioral patterns. Specifically, significantly higher scores were anticipated for the successful salesmen on the following scales: Do (dominance), Cs (capacity for status), Sy (sociability), Sp (social presence), Sa (self-acceptance), and Wb (sense of well-being). The Py (psychological-mindedness) scale was also expected to show a similar difference.

A Top Group (N = 28+) and a Bottom Group (N = 30) of salesmen were selected out of a Total Group (N = 118) on the basis of gross average monthly sales and other variables constituting an overall individual rating of worth to the local investment firm involved. The Top and Bottom Groups were matched on a general group basis for age, education, and length of service with the company. Means, standard deviations, and "t" test ratios between means were calculated for the two sample groups on all 18 CPI scales.

The hypothesis was largely confirmed. The mean of the Do (dominance) scale distinguished the Top Group from the Bottom Group at better than the .05 level of significance. The Sp (social presence) and Py (psychological-mindedness) mean differences were significantly higher for the Top Group at the .02 level. Furthermore, the mean difference for Sy (sociability) and Wb (sense of well-being) reached

the .01 level of significance. In addition, the Top Group mean on Ie (intellectual efficiency) was significantly greater than the Bottom Group mean at the .05 level. The hypothesis was not confirmed with regard to the Cs (capacity for status) and Sa (self-acceptance) scales.

The results indicated the importance of considering the social behavioral pattern in selling. It was concluded that the CPI was of value in distinguishing successful from unsuccessful salesmen in the firm studied.

To give background to this work, an extensive survey of the literature was undertaken with special emphasis on personality assessment in relation to salesmen selection.

ACKNOWLEDGMENTS

During the preparation of this thesis assistance was extended to me from various sources. First of all, I want to thank Dr. D. Spearman of the Department of Psychology for the learning experience provided throughout the project. I am deeply grateful for his constructive advice and helpful suggestions offered at every phase of the investigation. Moreover, I am indebted to Miss L. Wilson of the Department of Psychology for consultation and for the encouragement given during the preparation of this work. Furthermore, acknowledgment is made to Dr. C. Uhl of the Department of Psychology for his help with the statistical aspects of the thesis. Finally, I am grateful to the company officers and to the salesmen of the firm studied for their constant co-operation and assistance, without which this thesis could not have been completed.

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CHAPTER I

INTRODUCTION

Industry's problem of selecting salesmen is not a new one nor has the search for an answer been strikingly successful. Over the past forty years, the literature related has been prolific but uneven, characterized by a sameness of viewpoint regarding the complexities of the topic. It is recognized and roundly emphasized by most writers, be they business men or researchers, that failure to resolve the challenge of selection results in a great loss of human potential, to say nothing of the enormous loss to industry as measured by both tangible and intangible factors.

How important is the salesman in our economy, and how costly is his failure to function profitably as a part of that economy? Stevens (1960) has said that the salesman is at the center of our business world. Management would seem to agree that selling is the "cornerstone" of the economic situation. Tomorrow's market may well be one of the greatest opportunities and challenges which the business community has ever been asked to meet. With the constant flood of new products and imports onto the market, the increase of automation with its great output potential, and the mounting population, the claims of Hauser (1960), and Stanton and Buskirk (1959) concerning the doubling of the gross national product by 1975 are not entirely unrealistic. It is conceivable, then, that the salesman will become increasingly important. If the business challenge is to be met and if the salesman is to contribute in the fullest sense to a continued rise in an already

high standard of living, his functions, especially at certain levels of business, will take on those of an entrepreneur, a "marketing representative" (Crissy, 1959), or a "professional communicator" (Stevens, 1960).

Cleveland's study (1948) found that the number of people engaged in sales operations in the United States increased from just less than three million in 1940 to more than five million in the years following World War II, and that the cost of replacing lost personnel amounted to astonishingly high figures. It is a well known fact that turnover, repeated salesmen hiring, and training costs, represent a large proportion of industry's expense. This, of course, is all reflected in the cost of production. As far back as 1939, McMurry warned that with "today's competitive conditions," a company can ill-afford high turnover, "drifters-with-the-tide," or an indifferent level of production. Today, more than twenty years later, it is even more essential that production costs be kept competitive, highlighting the importance of making the fewest possible mistakes in selection.

What does a mistake in hiring cost? In McMurry's article, the cost of hiring a salesman in 1939 was reported as being a minimum of fifty dollars. In 1955 (McMurry) the direct cost of <u>turnover</u> in a 50 man sales force dealing with automobile accessories amounted to forty thousand dollars a year. Wagner (1952) reported that the Life Insurance Agency Management Association had pointed out that over 1000 ordinary life insurance agents were hired each month in Canada and the United States at a minimum individual cost of fifty dollars. Stanton and Buskirk (1959), quoting Mandell's (1955) work, reported that 136 member

companies of the American Management Association estimated the average cost for each salesman failure at $6,700. Twenty-five firms went so far as to say that an error in hiring cost $10,000. Still and Cundiff (1958), from a survey of a company with 55 branches and a sales force of four thousand, offered that a mistake in hiring cost over five thousand dollars. It is recognized that these figures do not include a dollar estimate of the intangible costs to industry, such as loss of sales, loss of customer good will, and poor morale within the firm. Nor do they take into account the very real cost to the individual who is hired and who fails to make the grade. In evaluating the cost of personnel to business, Flanagan (1949) commented that in 1948, one hundred and ten billion dollars was paid out by private industry for salaries and wages. With this level of expenditure, it is only reasonable that an organization might be more than mildly interested in trying to realize a return through a good selection program. Today's emphasis on employee security, union strength, and the seniority system, adds even more weight to the importance of improving decisions at the hiring stage.

Selling is a basic aspect of a nation's economy, and the problem of selling successfully turns out to be everyone's concern. Not only does it appear to be an important unsolved problem, but it is one that continues to cost large amounts of money. It would seem both reasonable and opportune, then, to contribute research toward understanding some of the ramifications involved in the situation.

Difficulties in the Selection of Salesmen

Most writers agree that the basic problem lies with improving decisions in the initial stages of hiring. This thought is based upon the conviction that the proper selection of salesmen is the key factor in the successful functioning of the sales force (Fleishman, 1961; Stanton and Buskirk, 1959). This does not mean, however, that recruitment, training, motivation, and the rest should not receive full attention. It cannot be said that the subject of selection has been neglected. Super (1940) commented that indeed more attention has been devoted to the problem of selecting salesmen than to possibly any other single occupational group. Appreciation as to the complexity of the problem is revealed by Lawshe's (1948) reference to Shartle's[1] work on 20,000 occupations in which he offered that salesmen are the most difficult vocational group in which to achieve good selection. Bolanovich and Kirkpatrick (1943) would appear to agree with this conviction. There are many different kinds of selling jobs, and those involving creative or specialty sales are probably the most difficult (McMurry, 1957; 1961; Stanton and Buskirk, 1959). Moreover, there are many kinds of salesmen.

There are many good reasons why the problem of successful selection within the salesmen group remains consistently elusive. One is that among personnel officers there has been a general lack of adherance to the scientific method. Another one is that even amongst professional people it has often been extremely difficult to make use of

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1. Shartle, C.L., The Measurement and Selection of Salesmen. Mgmt. Rev., 1944, 33, 93-95.

the scientific method in a business or industrial setting. In consequence, there have generally been inadequate job analyses, job descriptions, and a lack of valid criteria of sales performance. All of this has resulted in confusion regarding the characteristics thought to be required in a good salesman.

The Scientific Method in the Selection Program

Down through the years, the approaches to employee selection have been many and have varied all the way from superstition and intuition to the most complicated and supposedly scientific procedures. The most thorough recruiting, the most diligent training and the best management simply will not compensate for the lack of fitting the right man to the right job. In the past fifteen years, more and more companies, especially the larger ones, have become increasingly aware of and, indeed, impressed by the wisdom of following the more valid selection procedures. Through setbacks and failures in their personnel programs many business firms have learned that good research, establishment of realistic criteria, careful validation, and determined follow-up are rewarding. Although the possible benefits derived from a sound selection program are obvious, it does not follow that good selection programs are numerous. While this is well recognized, there has been little argument about the steps to be taken within the actual selection program (Bolanovich and Kirkpatrick, 1943; Cleveland, 1948; Flemming and Flemming, 1946; Foley, 1946; Griffith, 1949; Johnson, 1957; Kirkpatrick, 1945; Kornhauser and Schultz, 1941; Maier, 1946; Moore, 1942; Ohmann, 1941; Phelps and Howard, 1960;

Ryan and Smith, 1954; Stanton and Buskirk, 1959; Super, 1940). Flanagan (1949) held that the scientific approach, embodying the formulation of hypotheses, systematic observation and experimentation, was not only desirable but feasible. The results of such sound methodology could then be supplemented by more adequate theoretical formulation based upon observed facts rather than a collection of impressions.

Job Analysis

A good job analysis is the foundation upon which the worth of the entire selection procedure rests. This very important first step is necessary in order to obtain a clear picture of the job and worker specifications. Then, selection tools such as tests may be employed to further delineate the human elements of successful and unsuccessful employees. Flanagan (1953) contended that confusion arising from generalities, descriptive of the salesman's job, would not occur if adequate specifications were derived from a systematic and thorough analysis of job requirements. Selection procedures, he added, could then be based on the collection of factual data. A critical aspect of the job analysis is pointed out by Crissy (1959), Phelps and Howard (1960), and Super (1940) who saw the importance of taking the "job environment" into account. The job environment is, after all, the setting in which production occurs. Roe (1956) reported that investigation in life insurance agencies suggested that the quality of management was as important as the Aptitude Index for predicting performance as measured by production. This of course emphasizes that the environmental aspect of any job must be

considered when comparing various studies. This factor is often neglected in setting up selection procedures and may be one very good reason why certain programs serve well in one situation but fail miserably in another. Again, the "custom-built" plans which take into account the job environment often endure better than more standardized procedures.

Criteria

The importance of establishing meaningful criteria is emphasized by most writers (Bills, 1939; Cleveland, 1948; Dorcus, 1940; Flanagan, 1953; Hay, 1961; Lawshe, 1948; Lovett and Richardson, 1934; Ohmann, 1941; Phelps and Howard, 1960; Thorndike, 1955; Viteles, 1941). It must be accepted that the scientific selection procedure is only as good as the criteria used. Thorndike (1949, p. 12) wrote: "We cannot test a program for the selection of salesmen until we have some measure of the success of each man in the type of selling for which he was selected." This would emphasize that the criteria by which we judge a man successful or unsuccessful need critical examination.

Procedures must be standardized on present employees and validated on actual applicants to determine their true value in distinguishing between potentially satisfactory and unsatisfactory employees. The objective in mind is the elimination of as large a proportion of the marginal men as possible, while retaining the optimum number of those who will succeed. The sound validation of any procedure used in selection must be related to the particular operation in the specific situation in which the individual is to be employed.

A good standard in one situation may be inaccurate and inadequate in another. As a criterion, the volume of sales may be quite meaningless. Some companies consider qualitative judgments of intangible factors, such as service to customers, to be more accurate and more valid criteria of achievement in their particular kind of business. Just as there is probably no such thing as "general sales ability", there is no one criterion of success that can be used for all kinds of selling jobs with their widely different conditions and requirements (Flemming and Flemming, 1946).

Krug (Gilmer, 1961) commented on the problem of criteria and he insisted that "success is always multidimensional". The job selection criteria must therefore be related to the total criterion field, which should contain the minimum number of dimensions necessary for an adequate description of success. Krug warned that the selection of criteria always involved an arbitrary judgment at some point by management. Since it is at this critical juncture that so many otherwise carefully worked out selection procedures are less than adequate, it is an absolute necessity that the researcher be sufficiently acquainted with the executive's attitude and evaluative skills so as not to allow poor judgment to invalidate the work that has gone before.

Personality Characteristics of Salesmen

The question of what characteristics a salesman should possess has inspired lengthy, non-objective, and inconclusive lists of so-called "necessary qualifications". These are often subject to much disagreement and are usually rather difficult to relate to the job in question. The

possession of the qualities listed as required in the successful salesman would often seem to eliminate most of the population. The sales manager or researcher who has had experience in sales may claim different qualities as being essential than will the non-sales theorist. The economist or the psychologist may produce yet another compilation. Obviously, then, each is influenced by the special contacts with business which he has experienced.

The proposition that there is one type of salesman who will be successful in any type of selling under any conditions is untenable. Industry no longer accepts the myth of the "born salesman" (Mandell, 1955). The root of this myth seems to have been in the hard-to-kill notion that there are inborn qualities which mark the true salesman. This notion of a "sales type" is discussed by McMurry (1957). The salesman is viewed from a new angle in McMurry's (1961) outstanding article: "The Mystique of Super-Salesmanship". The characteristics of the successful salesman are too often described by sales managers in a stereotyped fashion and not in terms of a particular job in a particular company. In fact, it may even be the stereotyped view that has created the myth. It is within conceivability that with today's increased emphasis upon the requirements of specificity, drawn from the rather persuasive literature in this regard, a new and equally mythical salesman is being created; namely, the "customized" salesman selected for and adapted to the particular company. Inasmuch as human beings are not thoroughly unalike, and therefore lack the specificity called for in this narrower conception, so it is unlikely that this newer myth will be any more useful than the older one. In any case,

it is not reasonable to think of hiring mythical beings.

Selling may appear to be a unitary activity. But, it is easily seen that various kinds of selling jobs make different demands on the same traits. For example, self-reliance may be defined in widely different ways in the over-the-counter sales clerk and the man selling shares in a proposed mining venture. Different selling jobs may require different amounts of and, indeed, entirely different behavioral and mental traits and, while it is within expectation that these will be rather specialized personalities at the one extreme, the very fact that salesmen are human beings will force a general resemblance no matter to what extent the specificity has proceeded. It might be further commented, then, that the "perfect salesman" of the future will be a combination of both ends of the myth continuum; that is, he will be a special combination of general and individual qualities. This would appear to follow the classical tradition of mental and personality traits.

The absence of agreement among psychologists and sales managers concerning the essential qualities of salesmen was demonstrated by Moore (1942, pp. 492-493). He found that of the forty qualities chosen as essential by his three groups of judges, there were only three: Character, Personality and Knowledge of Goods, that were common to all lists. Further, there were only four additional qualities: Mental Ability, Tact, Initiative, and Memory, that were common to any two.[1] It is possible that there would be even less agreement

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1. A careful perusal of Moore's material, however, revealed that Tact appears on all three lists.

when it came time to define the qualities upon which agreement had been settled.

Many books and articles on selling contain what might be referred to as the omnibus method of listing characteristics of salesmen. Two such lists will be given here as representative of the field. Tosdal (1957, p. 580) offered that the qualities which must be looked for include character, personality, health, native intelligence, concentration, industry, self-confidence, punctuality, tact, initiative, resourcefulness, and knowledge of goods. Some of the attributes seen as necessary by Canfield (1958, Ch. 1) include industry, energy, organization of effort or planning, discipline, the ability to maintain good personal relationships, physical fitness, sincerity, honesty, integrity, self-confidence, enthusiasm, courtesy, imagination, resourcefulness, initiative, tact, loyalty, genuine liking for people, tolerance, and creative original thinking. While it is true that any or all of these traits may be useful to the salesman or to anyone, for that matter, they are meaningless for the actual task of selection. Because such generalities lack definition, depth, and relevance, they can only add to the confusion. Descriptive lists commonly appear in trade journal articles and in the after-dinner speeches of sales managers, personnel officers, and consultants. McMurry (1961) branded as "fatuous" the attempt in many books on salesmanship to come to grips with the essential qualities distinguishing the successful salesman from the unsuccessful. He felt that his own treatment of the subject was "much more realistic than the glib, glad-handing" approach that often has characterized such presentations.

McMurry (1961, p. 117) was convinced that "the possessor of an effective sales personality is a habitual 'wooer', an individual who has a compulsive need to win and hold the affection of others. He is not born with this need; it is the product of his early environment. But it develops so early in life that for all practical purposes it might as well be inborn." Because the salesman's blandishments are not based on a sincere desire for love, "... his wooing is primarily exploitive; he seeks to win the affection of others the better to use them for his own selfish purposes." Again, McMurry offered that the salesman "... is not consciously aware of his predilection for wooing people. He does it entirely out of habit, rarely by design - but constantly, so that he is said 'always to be selling.' The fact that his wooing is intuitive explains why he so often has difficulty in explaining how he accomplishes results." In addition to the "wooing instinct", McMurry saw other qualifications as important: a high level of energy, abounding self-confidence, a chronic hunger for money, a well-established habit of industry, and a state of mind which regards each objection, resistance, or obstacle as a challenge.

This analysis, while it may be fairly penetrating from the psychological point of view, may be incomprehensible, if not directly disturbing, to the salesman, sales manager, and the general consumer public. It may, however, be entirely true at some levels of selling. No matter how reasonable McMurry's contention is, it is very probable that it would be most difficult to measure the so-called "wooing instinct" or to otherwise consider it concretely in the problem of selection.

Requirements which are merely abstractions or descriptions of ideal types were criticized by Crissy (1959). He insisted that the delineation of realistic requirements for a particular job must have relevance to that job, be observable, and measurable. In summary, Crissy said that the successful salesman cannot be too flexible nor too volatile. Since it is important that he relate closely to a variety of people, he must be able to maintain good relationships. Furthermore, as his job is not to "reform" customers, he should be an extremely adjustable person. He very probably must appear to adjust to them in order to serve his own purposes.

To discover what factors sales managers considered important for success in selling, Benge (1956) had managers rate 564 "excellent" and "poor" salesmen. The ratings were done on 50 "traits" covering personality elements, attitudes, and work habits, which were then assembled into ten related "attributes". It was found that on the average score for all ten factors "excellent" salesmen exceeded "poor" salesmen by 48 per cent. The specific attributes found to differentiate most sharply between the two groups of salesmen were self-confidence, the ability to do intelligent planning, industriousness, and persuasiveness. These were followed by intelligence, interest, and technical knowledge. Other factors included ambition, health, and social development. It was interesting to note that traits in which salesmen as a group score high are less accurate predictors of success than traits in which they score low.

A study by Hughes (1956), based on the content analysis of

an applicant's free response to a question on an application blank, attempted to relate personality need to sales success. He reported that "dominance", defined as skill or satisfaction in dominating, convincing, securing the confidence of others in interpersonal relationships, was a significant predictor.

The necessity of being persuasive and skilful in social contact, as well as having trade and clerical knowledge was considered essential in Cleveland's (1948) well-organized review.

The idea that salesmen are called upon to do two very different jobs rather than simply one was put forward by Kahn and Shuchman (1961). They divided the field into the two major divisions of creative and maintenance selling, and hypothesized that the ability to handle both aspects of the operation is seldom found in the same individual. They supported the contention that the creative sales development job is the more difficult. The creative salesman must have rather considerable powers of endurance to handle the exacting demands of the creative interpersonal challenge. He needs empathy, an alert "third ear", introspective skill, superior intelligence, and an inventive imagination. It is possible that this kind of individual would find maintenance selling not sufficiently demanding of his resources. The maintenance man in being more stable and consistent may be less colorful and inventive, and better able to concentrate on service to the customer.

Further Thoughts on Salesman Selection Programs

There is an abundance of material available on selection procedures for salesmen. On the surface of things, it would seem that

if the procedures are carefully followed there should be little problem in improving selection. This, however, is not the case. The successful selection of salesmen continues to be a very real problem for business and industry.

There are undoubtedly dozens of reasons why a selection procedure does not fulfil the hopes of management. One of the more problematical is the incompatibility of need existing between management and the researcher. The sales executive is vitally interested in immediate results, while the scientist seeks valid facts from which accurate predictions can be made. The essential facts cannot be quickly discovered. Moreover, management's expectations from the selection procedure are often unrealistic and for this reason there may be impatience with the delay in achieving results. It is the scientist's responsibility to make management aware of the time-consuming complexities inherent in a selection procedure. It must be made clear that even the best program cannot be perfectly predictive because of the human element involved, to say nothing of the situational difficulties arising in the milieu of the organization in which the salesman finds himself. A non-professional may have no notion of what is involved when he asks for a "simple test" to reveal to him whether or not a man will be a successful salesman. Furthermore, there is often no realization of the cost of installing a program, nor of the importance of maintaining it at the highest level if the best results are to be produced (Foley, 1946). Super (1940) emphasized that good selection procedures take time, money, and able administration by well-trained people if good predictive results are going to be obtained.

He scorned the folly of imagining that any one test such as "ability to sell" will give an adequate picture of all the facets necessary to predict success. Taylor and Nevis (1953) pointed out that many programs are badly neglected or even abandoned by management and psychologists alike once they are properly set up. If a program is left in the hands of the operating personnel without the establishment of adequate controls, they predicted that in less than a year serious deterioration would occur. These authors felt that no selection system should be installed unless realistic control and follow-up plans were provided beforehand. Management should be fully aware that the development of procedures must be a continuing process taking into account changing conditions which may induce changed job demands. Frequent validating studies must be conducted for it may be discovered that scientifically established methods have become obsolete.

The personality of the individual administering the program is important (McMurry, 1944). When a scientist is hired by a firm to install a salesmen selection program, he usually finds it necessary to work closely with the sales manager. Difficulties between these two individuals can arise simply because of differences in training, outlook, and need. The sales manager may be viewed as an amateur by the scientist, especially insofar as the technical aspect of the program is concerned. By contrast, the sales manager may consider the scientist to be altogether too academic and lacking a comparable grasp of the firm's policies and problems. Then, too, the painstaking and coldly objective scientific approach is foreign to the sales manager. He is accustomed to proceeding on action levels and is often secretly convinced that his years of

experience in working with salesmen have given him intuitive skill and shrewdness in selection. Indeed, upon the impression of being threatened, he may consciously or unconsciously impede the progress of the program feeling that the scientist does not know all the answers. Obviously, if the program is to be successful, the two must work together each directing his special knowledge and talent toward the common goal.

Once management is convinced of the worthwhileness of a specific program, and the necessity of co-operation, there is still much to be accomplished. It is important to get the co-operation of sales managers, supervisors, and the salesmen themselves. This is especially critical when testing is to be part of the selection procedure. A special problem arises when certain procedures must be handled by branch managers away from the supervision of home office. In these cases, it is of prime importance to secure the co-operation of the branch manager so that he will not change the conditions under which the system was established. He must be convinced that if the selection program is to be adequate no step can be ignored or carried out in a careless fashion.

To further plague the researcher responsible for setting up a sound program, account must be taken of factors which impinge on the situation: the presence of continued technological and economic change producing both sudden and gradual changes in job duties; a change from time to time in the calibre and number of available applicants; recruitment; training; supervision; remuneration and incentive; and the management personnel. Flemming and Flemming (1946) illustrated this latter

point when they said that in their experience salesmen engaged in the same type of sales operation with competing firms showed quite different psychological test patterns derived from their group average scores. The authors felt that such a phenomenon probably reflected differences in the organizational set up, company policy, and the overall corporation "personality". In their view, these factors appeared to have some influence on personality as revealed in the psychological tests. On the other hand, the view might be taken that these two groups of salesmen, although performing almost identical tasks, are actually different persons, and would remain so even though they were to exchange jobs. This argument would support the idea that it is possible to perform any one particular job in a variety of ways, and that to equate two groups on the basis of success alone is not enough.

CHAPTER II

SURVEY OF THE LITERATURE
THE PERSONALITY ASPECT OF SALESMEN SELECTION

Introduction

In the background of Industrial Psychology, much more scientific research appears to have been done upon production than upon the matter of selecting those who are to be engaged in fulfilling production quotas. It is to be hoped that as good results will eventually be achieved in the selection aspect. In the selling field, the research done in the various large insurance companies constitutes the only really comprehensive attempt to apply measurement and scientific method to salesmen selection (Wagner, 1952).

The problems dealt with in salesmen selection are sufficiently complex to involve the use of many techniques in order to obtain as much pertinent information as possible. Maximum effectiveness cannot be obtained from any one "magic method". The multiple approach may include such varied procedures as:

1. The interview: standard, weighted, planned, structured, patterned, non-directed, analytical.
2. The application and personal history record: standard or weighted.
3. The critical incidents technique.
4. A psychological testing program.
5. Rating methods.
6. References and credit reports.
7. The use of photographs.

8. The physical examination.

9. The interview with applicant's wife.

10. Miscellaneous: Forced-choice Techniques; Situational Performance Procedures.

Business and industry use combinations of such selection procedures with varying emphasis upon the different aspects. The multiple approaches are fully covered in texts on industrial psychology, selling, and selection, as well as in the scientific literature. Inasmuch as psychological testing is the point of emphasis here, a representative review of the literature will focus upon the psychological test aspect of salesmen selection. Many of the more general studies include interesting work derived from some of the other selection procedures as well as on psychological test findings. When this occurs, emphasis will be centered on the test findings. Further, special attention will be concentrated on those studies concerned with personality tests, since the personality test was the focus of the present work.

Preliminary Work: circa 1924 - 1944

As early as 1924, Bingham and Davis working with 73 records of executives, sales managers, and salesmen, offered the finding that superiority in intelligence above a certain minimum does not contribute as much to business success as superiority in several non-intellectual personality traits, such as the ability to persuade and control people.

Lovett and Richardson (1934) worked with large groups of soap salesmen in the Proctor and Gamble Company which had employed a

selection program using tests as early as 1923. Tests of sales ability were empirically constructed within their own company. The items covered the areas of mental alertness, business information, personality (social intelligence, dominance-submission), social attitude, and interest. The criteria were based on a descriptive rating scale, a paired rating scale, a confidential report (rating of job adjustment, personality difficulties, etc.), the percentage of quota sold, the percentage of dealers who bought, and the cost of selling a box of soap. The judgments in each case were made by two or three supervisors on special forms standardized for the purpose. About 900 items in all were related to the criteria and those items which did not differentiate between successful and unsuccessful salesmen were discarded. Re-test reliability of each test was reported as being .74.

The authors found that in this group of salesmen, who were selling a tangible product, those items relating to personal adjustment gave the highest correlations with sales records and were thus given the highest rating in an appraisal battery. Dominance-submission items correlated slightly lower, followed by those involved with social attitudes. Although mental alertness was not found to be of special importance in selecting for sales, it had value in selection for promotion.

As early as 1934, Achilles and Schultz were doing research stemming from the belief that successful salesmen possess certain personality characteristics which differentiate them from non-salesmen or from less successful salesmen of the same product or service. In line with their belief, they investigated the dimensions of ascendance-submission and introversion-extroversion, as well as other characteristics.

An extensive battery of interest, personality, and intelligence tests were given to 557 new insurance agents and 62 assistant managers when they attended one-week home-office schools. The tests used were: 1) The Beckman revision of the Allport A-S Reaction Study; 2) The Short Root Introversion-Extroversion Test; 3) The Bureau Test VI for Mental Alertness (on one large sampling); 4) The Pressey Senior Classification Test (on another sample); 5) The Strong Vocational Interest Blank; 6) The O'Rourke Vocabulary Test (given to one sample); and 7) a specially devised Sales Objection Test.

The managers, compared with the complete group of new agents, scored eleven points higher on intelligence and some two points lower in ascendance and extroversion. When the "terminators" were separated from the sample, it was found that for intelligence they were twelve points below the average of the non-terminated agents, and twenty-three points below the average of the managers. For ascendance, the "terminators" were four points below new agents and two points below managers. The extroversion differences were not conclusive. The scores for fifty high and fifty low producers during the first thirteen work weeks indicated that intelligence averages were approximately equal. The high producers were 3.4 and 1.4 points above the low producers in ascendance and extroversion respectively. The Lovett and Richardson study mentioned above supported the ascendance findings but, contrary to the Achilles and Schultz data, found that the introversion-extroversion categories were not very useful in picking out successful salesmen or managers, at least in their firm. Achilles and Schultz questioned the significance of their findings with regard to ascendance and extroversion.

They suggested that a beginning salesman's pattern may be modified in a downward direction by experience and responsibility. This would explain the managers' lower scores on ascendance and extroversion.

It was felt that the ability to profit from training and experience, to understand instructions, to take the initiative, to meet people face-to-face, to exert influence, and to persuade were all essential personality characteristics of successful insurance agents. In order to further study these conclusions, Schultz (1935; 1936) re-examined the test results of the above-mentioned study. He compared the data with job-performance ratings and sales production as criteria. By this time, the agents had completed at least one year of work under presumably uniform conditions of training, supervision, salary, and financial incentive. The most significant results were in the comparison of the personality and intelligence test scores with actual sales production records. Extroversion and ascendance were still the most predictive factors of success, but only to a "moderate" degree. The intelligence test did not improve the selection of the "best" or "average" agents, but did eliminate more "poor" men. It was found that a comparison of results with the combined criteria did not reveal direct linear relationships. Had the intelligence and personality tests been used at the time of hiring to accept or reject agents, 69 per cent of the most successful group would have been hired and 31.3 per cent would have been rejected. In the average or middle group, 51.3 per cent would have been hired and 48.7 per cent rejected. Of those having the poorest sales records, 30.7 per cent would have been accepted and 69.3 per cent would have been rejected.

Extensive work was done by Bills (1936; 1938; 1939; 1941a; 1950) on weighted personal history forms, the Strong Vocational Interest Blank, and personality tests. Beginning in 1932, the Aetna Casualty and Surety Company operated an intensive training school for their casualty salesmen, thus providing an ideal opportunity for a testing program which became the basis for a large amount of research. During the first year of the school's operation all agents were given the Strong Vocational Interest Blank and the Bernreuter Personality Inventory, designed to measure emotional stability, self-sufficiency, extroversion-introversion, and dominance. Bills and Ward (1936) reported that a combination score, based upon the Strong test's life insurance and real estate scales, and Bernreuter's extroversion and dominance, seemed to give "remarkable predictability" of the success of the individual as a casualty salesman.

Those agents who took the tests during the first year completed a second set of the test blanks at the end of a one-year period. The report on 96 cases of first and second tests, given approximately one year apart, confirmed the first phase of this research in that it showed predictability for those persons whose interests definitely centered around the selling occupation or definitely outside of the occupation. As far as the personality traits were concerned, it was found that there was success for those who scored high in emotional stability, self-sufficiency, extroversion-introversion, and dominance, but not for those who scored low. Reliability coefficients for the four tests were .69, .65, .71, and .72 respectively. It was also

shown that there was little tendency for the person who shifted in personality traits to also shift in interest, and vice versa. In studying just those men who were rated "successful" and "failures" it was observed that the successful men tended to increase their scores in the direction of the ideal interest and personality traits for that occupation, while the failures tended to depart further from it.

The Strong Vocational Interest Blank and personal history data formed the basis for much of Bills' (1938; 1939; 1941a) continuing research. These studies involved large numbers of casualty and life insurance agents.

A 1950 summation by Bills observed that the research with casualty agents indicated that intelligence test scores bear little relationship to success in jobs requiring ordinary mental ability or alertness. Regarding interest test results, Bills reported that for life insurance and casualty salesmen in general, those scoring high on the life insurance and real estate scales had three times more chance of success than a low scorer. Moreover, it would seem that by 1950 Bills was convinced that the personality tests then in use were not predicting with any degree of success. At the same time, personality adjustment was recognized as one of the outstanding factors in successful salesmen. No evidence was found that any personality test other than the Bernreuter was used in the various studies. Bills (1941b; 1950) contended that all personality inventories were "bluffable" and that because this tendency was more unconscious than conscious, it was

difficult to detect.

To investigate the social dominance factor in successful sales people, Dodge (1937) used the test records of individuals who came voluntarily to the Adjustment Service, New York City, for guidance. The threefold basis for selection of test records was: 1) at least three years' experience in the given occupation; 2) at least one year of employment with a single employer; and 3) a longer experience in the given occupation than in any other. The Bernreuter Personality Inventory was used. A comparison of test scores of 300 clerical and 154 sales people indicated highly significant differences with respect to the social dominance (the dominance-submission) score. The experienced sales people appeared to possess this trait or characteristic to a greater degree than did experienced clerical workers. In addition, Dodge reported that the University of Minnesota Employment Stabilization Institute supported his findings. They observed that the sales group was significantly more dominant in face-to-face situations than the unskilled, semi-skilled, or skilled groups of other occupations.

Dodge (1938a) cautioned against accepting a high score on the Bernreuter social dominance trait as proof that sales success would follow. To further investigate the dominance factor, he tested 75 sales people in a department store who had been rated for sales success by their supervisors. A low correlation (+ .16) was found to exist between the social dominance score on the Bernreuter and sales success. A correlation of this magnitude was not considered to be of

any predictive value and no other scores showed any higher correlation with sales success. Dodge then did an item analysis on the inventories of the top 18, the bottom 15, and finally on the remaining 42 sales persons in the sample. Significant differences were obtained. A scoring system set up on the basis of this analysis was found to differentiate between the best and the poorest sales people and there was no overlapping. When applied to the remaining 42 sales persons in the middle grouping, it was found that the scoring system validity was +.60 for men and +.36 for women. It is evident from his writing that Dodge (1938b) believed personality was the important factor in occupational success and declared that along with the "sales personality", he would like to see various other occupational personalities isolated.

Others working in the field at the time commented on Dodge's findings. Bills (1939) regretted that validation work had not been done. Viteles (1941) suggested that such studies were good but that they needed more refinement to be useful. Flemming and Flemming (1946) criticized Dodge as giving too much weight to a single trait as a predictive factor in sales success. Statements made by Dodge himself would seem to indicate that this last criticism was not really warranted.

A careful study (McMurry, 1939) of selection methods in selling was done jointly by Kornhauser, Richardson, Stevens, and McMurry, in co-operation with the Phoenix Life Insurance Company, the Metropolitan Life Insurance Company, the Proctor and Gamble Company, and the Life Insurance Sales Bureau. The procedures used included a weighted application form, a sales personality test, an analytical interview, and a standardized interview. Research men, entering the field as

salesmen, did the job analysis. Standardization and validation for the first three procedures mentioned above were carried out on 900 salesmen chosen randomly in eight cities throughout the eastern and middle west United States. The men were carefully rated by their superiors as "valuable", "average", or "unsatisfactory".

The sales personality test consisted of a shortened form of the Otis Test of Mental Ability. The personality items included those developed by Kornhauser for life insurance agents as well as specific items derived from the job analysis. In discussing this study, Wagner (1952) reported that the personality test contained: 1) statements on controversial issues concerned not with an applicant's beliefs essentially, but with the degree of self-confidence he had in expressing his opinions; 2) items concerned with attitude and interests, enthusiasms, energy, and emotional balance; 3) six self-ratings of personality; 4) preferences, as well as items taken from tests designed to measure dominance, submission, introversion and extroversion. Item analysis first reduced this test from 400 items to 155, and later to 68 weighted items. For this standardization, the records of 257 salesmen were used.

It might be mentioned here that items dealing with intelligence were withdrawn from the test. McMurry (1939) pointed out that this investigation supported earlier findings (Bingham and Davis, 1924; Lovett and Richardson, 1934; Achilles and Schultz, 1934; Schultz, 1935; 1936) suggesting that intelligence and success in selling did not correlate significantly. While these early researchers did not give much emphasis to intelligence, it must not be thought of as lacking in significance

entirely. Also, it should be remembered that intelligence is an aspect of personality. Moreover, it is necessary for salesmen to possess a reasonable amount of intelligence. The amount of intelligence required certainly depends on the demands of the job. When the salesman is being selected with promotion to the managerial level in mind, the factor of intelligence might necessarily be given some increased consideration. It may further be that selling emphasizes a different kind of intelligence, possibly one that is not detected by the usual intelligence tests. The salesman may indeed be required to have more of this special kind of intelligence than some studies would indicate. Conceivably a good salesman would need to have a fairly high level of social intelligence, problem solving ability, interpersonal ingenuity, mental alertness, and the like. It is interesting to consider that most intelligence tests are rather heavily weighted with "academic" items, and it is quite possible that salesmen have pursued other directions.

Validation procedures in this study were repeated on actual applicants in six mid-western cities over a period of eight months. A further follow-up study was done on close to 1700 men in seven eastern and mid-west cities in the United States over a period of one year. The minimum-standard people, that is, those who normally would not have been hired were, for purposes of the study, not rejected. A subsequent comparison was done on the performance of men who would have been accepted by the procedure as against those who would have been rejected. The criteria were sales production and supervisors' ratings. It was found that the man whose test responses characterized him as

self-reliant, independent, and self-confident, had twice the number of chances of success as the man who lacked emphasis in these qualities. From the results of all the procedures used, McMurry (1939) claimed that very considerable savings were effected. A 23 per cent reduction in turnover and a 6.5 per cent increase in the average level of production were viewed as consequences of improvement in selection.

In evaluating this study, Wagner (1952) commented that the combined procedures eliminated 31.8 per cent of the failures, 22.4 per cent of the average salesmen, and none of the desirable men. The personality test alone rejected 19 per cent of the failures, 14 per cent of the average group, and 3 per cent of the desirable salesmen. Wagner complained of a lack of data regarding the reliability of the test and criteria.

During this period, Steward (1940) had developed his Composite Inventory and Examination for use in the life insurance business and "other fields of similar requirements". His method consisted of 1) a short form of the Otis Mental Ability Test, 2) a modified form of the Bernreuter Personality Inventory to measure dominance, aggressiveness, initiative, and stability, 3) a general knowledge examination, 4) a vocational interest in selling inventory, 5) a new Personality Trait Illustration Test, 6) a personal history section, and, finally 7) Steward's Rating Form. Steward claimed that his step-by-step Rating Form forced attention on to the characteristic being measured by the various sub-tests, the results being narrowed down to a final rating. The Personality Trait Illustration Test was novel in that

besides answering "yes" or "no", an applicant was required to give "acceptable illustrations " of his decisions out of his own experience. Standards of illustrations were furnished to describe the various success categories. During the period 1935 to 1940, the procedures were refined and validated.

According to these investigations, successful salesmen displayed more frequently and in a greater degree than the average adult the traits of self-confidence, self-assertiveness, aggressiveness, emotional adjustment, and an understanding of people. The final ratings under the Steward system were compared with 1935, and 1936-1940 earnings. The "Relation of Steward Ratings to Success" for 1936-1940, presented the average earnings of those rated "superior" to be approximately twice the earnings of those rated "acceptable", four times the earnings of those rated "borderline", and eight times the earnings of those rated "unfit". This work is criticized by Wagner (1952) on the grounds that no evidence was presented for the reliability of the ratings, the judgments, or of the selective inventory items.

The development of the Aptitude Index for Life Insurance Salesmen, begun in 1932, was reported by Kurtz (1941). It is generally considered to represent one of the most exhaustive studies ever attempted to appraise the value of personality factors which were supposedly highly critical for successful salesmen of life insurance. The Aptitude Index for salesmen selection consists of two parts. Part One is a prediction scale based on the personal history items drawn from application forms of something like 11,000 men. Nine items were ultimately selected

as showing a consistent difference between the responses of successful and unsuccessful salesmen. This work is a good example of rigorous evaluation of items in a personal history inventory before such items are actually used in a selection program. The discriminative items were assigned weights. A high degree of validity was claimed for Part One.

Part Two of the Index was developed by Kornhauser. The aim was to develop tests to measure some 38 personality traits believed to be important in selling. Such factors as self-confidence, dominance, self-assertiveness, emotional adjustment, and understanding of people were included. Eight sub-tests containing about 500 items were constructed. A difference between the scores of good and poor salesmen was found to exist on certain of the items. A follow-up study of 1,000 salesmen, whose degree of success or failure was actually known for the year 1939, resulted in four sub-tests being eliminated. From 1,433 new salesmen in 24 companies, a homogeneous group of 304 was selected. They had all answered the test items at the time of hiring, had gone into the insurance business full time, and could be classified as to the degree of success obtained. One sub-test now proved invalid, but the other three were retained.

The total weighted score, computed for the personal history record items and for the three sub-tests as a group, was combined to constitute the Aptitude Index and classified A, B, C, D, E. The criterion of success in selling was defined as: "one year survival at a production level equal to or greater than the median production for

one-year survivors in the agents' company." Multiple correlation coefficients between the criterion and the two parts of the Index were computed for different age groups and were sufficiently high to justify the use of both tests.

It was found that at age 25 and under, personality characteristics should be given about one and a half times as much weight as the personality history scale. For age 26 and over, the situation was reversed. The final classification of A to E was found to have about .40 validity as compared with first-year sales production. In addition, classification in A meant that the chances of staying in business were doubled over classification in E. Furthermore, the combined survival rate and sales production was found to correspond to the A to E classification.

Habbe (1944) said that the Aptitude Index was widely used from 1938. In the following six years nearly 400,000 tests were administered. Refinements or varieties of the Index are still being employed by the major insurance companies and validation has been carried on as a consistent policy. In Canada (Wagner, 1952) the Index is similarly being validated and improved.[1]

In discussing the Aptitude Index, Phelps and Howard (1960) affirmed that research had shown the Index to have differential validity depending upon age of salesmen and the quality of supervision. It is worth noting that the Index is more predictive for men than for

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1. Personal communication with the managers of two large insurance companies in Edmonton would confirm this.

women, and for inexperienced rather than experienced agents. It is possible that an insufficient number of female applicants have been studied, and that the more experienced agents come to acquire a degree of identification with company outlook thereby confusing their scores in an unknown manner. Tampering with and falsification of the Aptitude Index in the branches can seriously impair its usefulness. Phelps and Howard (1960) suggested that scoring at head office would protect validity of the test. While this is a worthwhile directive, it must be remembered that it protects but one end of the operation, namely, the scoring. The administration and actual writing of the test are other areas that very likely need to be better controlled.

The sampling, size, and distribution of the many studies done by Kurtz were praised by Wagner (1952). In general, however, he criticized the Life Insurance Sales Research Bureau (later the Life Insurance Agency Management Association) for failing to publish their research in scientific journals. He complained that much of the reported work contained only an insignificant amount of data on method, important detail, and validity and reliability information. He claimed that sufficient data were almost never presented by means of which significant differences between groups could be determined. For such reasons, Wagner declared that the work was difficult to evaluate and therefore of lessened value.

Later Developments: circa 1945 - 1955

Flemming and Flemming (1946) of the Klein Institute in New York City presented evidence upon the accuracy of qualitative

analysis of test scores. They claimed to be able to predict sales performance and to make valid recommendations for employment based on their analyses. They admitted, however, that this approach involved good judgment and understanding of the tests used, as well as an intimate knowledge of the conditions and problems of selling in the individual firms. Their article reported (see also Bernreuter and Jackson, 1946) on the results of a test battery given to the entire sales staff of 348 men in six companies. The tests used by these Klein Institute researchers were the Bernreuter Personality Inventory, the Moss Social Intelligence Test, the Washburne S-A Inventory, the Otis Self-Administering Higher Examination of Mental Ability, the Canfield "Sales Sense" Test, and the Strong Vocational Interest Blank. The analysts recorded their judgments as "satisfactory" or "unsatisfactory" and the company involved rated each man in the same way. The results indicated that 80.6 per cent of the salesmen judged "satisfactory" on the basis of the analysis of the test scores were likewise rated as "satisfactory" by the company executives. The tetrachoric correlation was .49 and the chi-square found to be significant at less than the .01 level.

Research carried out by Otis was reported by Habegger (1948). This investigation was done on heating equipment salesmen in a firm where "continuing research has been established" as a company policy. It is interesting from the standpoint of good research techniques. It involved research conducted to find the value of tests in a specific sales situation handled by trained people in a company willing to devote time and money to the project, and recognized that tests are

only one aspect of the selection program.

A sample of 153 salesmen were divided into two groups, "top" and "below par", as judged by management. The Strong Vocational Interest Blank, the Bernreuter Personality Inventory, and a test of sales aptitude were given to the experimental group as well as to a control group used to check the results obtained on the experimental group. Items which elicited uniform answers from the top group and contrary answers from the bottom group were selected, making up a composite picture of men known to be successful and unsuccessful. The above battery, known as the Sales Talent Indicator (STI), combined with the rest of the already established selection plan within the company, improved selection 62 per cent. It was claimed that a statistical and clinical analysis made of the results of this phase of the study and follow-up studies, showed that preliminary results were accurate. This balanced plan was looked upon as an improvement over the older method of selection for this company. It provided a favorable mixture of human judgment and objective test findings.

Barnabas (1948) commented that it was the experience of his consulting firm that the tests they used gave greater reliability and validity than any other instrument except intelligence tests, dexterity and other basic tests. From 1940 to 1948, 12,000 individuals were selected and placed by his firm. Almost all of these had been given the Bernreuter Personality Inventory. The Bell Adjustment Inventory was also administered, but was being employed experimentally. At least 1,000 persons received the Minnesota Multiphasic Personality Inventory. Barnabas cites reliability coefficients of from .81 to .93 for the

Bernreuter. Validity data are offered for the Bernreuter for several occupations, including "salesmen of several types and levels." Unfortunately, this article does not include sufficient material to allow an evaluation of the findings and is therefore not especially valuable.

One might wonder why the Minnesota Multiphasic Personality Inventory (MMPI), which is very widely used, has not contributed a great deal to the problem of selecting salesmen. One reason for this might be the obvious one that the MMPI is primarily psychiatric in its orientation and thus not well equipped to assess presumably normal people. Another reason would be that the work done thus far in this reference has not been especially promising. A validity study of the MMPI concerned itself with salesmen test records covering a span of ten years (Confidential Report 1956)[1]. It was found that there were no differences between average MMPI test scores obtained by salesmen rated as "good" and those obtained by "poor" salesmen. The conclusion was that the usefulness of the MMPI as an aid in the selection of salesmen was questionable.

When the Kuder Preference Record was used in a battery, Kahn and Hadley (1949) found that life insurance men could be identified but that the successful agents could not be distinguished from the unsuccessful. The conclusionsbased on this research were severely criticized by Wallace

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1. Confidential Report, Employee Relations Research; Research Report No. 2: Validity of Multiphasic Test in the Selection of Salesmen; loaned by member of Psychology Department, University of Alberta.

(1949) for the small sample of 84 men, the restriction of range, and criterion contamination. Wallace said that such work served only to introduce inaccuracies into an already confused field.

Rock (1951) developed the "Sales Situation Test" to measure what he called the element of judgment in selling. The test consisted of twenty-five actual sales problem-situations with answers being judged on a four-point scale. The items were analyzed for difficulty. A scoring scale was developed and weighted accordingly. The test was then validated on a group of 25 consumer salesmen, 26 production supervisors and superintendents, and 31 non-company salesmen in a technical field. It was reported that the test distinguished between selling and non-selling personnel beyond the 1 per cent level of significance. Furthermore, there was also a significant difference between the technical and consumer salesmen groups.

Bernard (1952) criticized Rock's (1951) work, claiming that the items in the "Sales Situation Test" were taken, without acknowledgment, from Canfield's test of "Sales Sense." He was also sharply critical of the absence of reliability data and of the lack of representativeness of the samples chosen. He suggested that the conclusions based upon such small samples were quite probably not helpful in the general selection situation.

Rock (1952) replied that his work had been intended as an introductory contribution, that small sample statistics had been

employed, and that validation was being attempted with more extensive samples. He also denied knowing beforehand that the items used were included in Canfield's test, and expressed regret that access to such work was not available in the scientific literature.

Tobolski and Kerr (1952) hypothesized that success in selling depended upon the salesman's skill in anticipating the customer's feelings and reactions. The Empathy Test was used to test their hypothesis. It suggested that the presence of empathic ability may be demonstrated in a subject's being able to predict the behavior of typical individuals in key interpersonal areas. The sample consisted of 32 automobile salesmen from two companies. Company A provided seven salesmen of new cars and 15 used-car salesmen. From Company B there were four new-car and six used-car salesmen. Criteria were Sales Ratio (the number of cars sold divided by the number of approaches) computed over a three to twelve month period, and sales managers' rank-order ratings. It was concluded that for new-car salesmen the Empathy Test scores were sufficiently predictive of the Sales Ratio ($r = .44$), and of job success as ranked by the sales managers ($r = .71$). On the other hand, the Empathy Test was a most inefficient predictor for the used-car salesmen (r's = .12 and .17). It was suggested that these less positive findings were quite possibly the result of enthusiastic but misleading television advertising. The actual car on the lot suffered by comparison with the advertised article. The build-up and subsequent let-down resulted in aggressive feelings and unpredictable behavior in the customer and defeated the salesman.

An attempt to validate the Empathy Test (Bell and Stolper,

1955), was not successful. The "Sensitivity to Other Persons" test and the "Empathy Test" were given to 72 college students. The correlation between the two was negative. The high scorers on the Empathy Test were no more effective at estimating the interpersonal relations within the group than were the low scorers. The authors suggested there was a need to define and investigate the actual kind of behavior measured by this instrument. They concluded that the test conception of empathy was wrong, or that it was not involved in certain situations.

Recent Developments: circa 1956 - 1962

A "Sales Comprehension Test" was developed by Bruce (1954). Over a period of eight years he reduced multiple-choice items which distinguished between salesmen and non-salesmen from 74 to 30. Validation on 1,007 non-salesmen and 397 salesmen provided evidence that the difference between the means of the two samples was significant at less than the 1 per cent level. Cross-validation on 661 non-salesmen and 334 salesmen also provided validity significance beyond the 1 per cent level. A battery of personality, mental ability, and interest tests was given to 86 salesmen and sales managers, along with the Sales Comprehension Test. The latter had a higher correlation with the criterion than any of the other tests ($r = .32$). The difference between groups was significant at the 2 per cent level with a 31 per cent overlap in favor of the managers. It was reasoned that, in general, sales managers should evidence a better level of sales comprehension than salesmen. The test did not correlate with any of the measures of intelligence used. The test-retest reliability coefficient was reported as .79 when corrected

for homogeneity.

Murray and Bruce (1959) attempted to discover whether or not a relationship existed between a combination of Bruce's Sales Comprehension Test and his Sales Motivation Inventory, and achievement in life insurance selling. The subjects were 60 experienced ordinary life insurance agents, all volunteers and chosen at random. The sample was divided on the basis of paid-for production into a "successful" group of 39 and an "unsuccessful" group of 21. The test results indicated that the Sales Comprehension Test did not distinguish the better from the poorer salesmen. On the other hand, the Sales Motivation Inventory did have predictive validity under the conditions of this study. When a combined test score was used, however, it was found that there was less than one chance in a hundred that the means of the two groups were not significantly different.

The Activity Vector Analysis (AVA) developed by Clarke (1956a) consisted of 81 descriptive adjectives. The applicant was asked to check every adjective or adjective phrase that in his knowledge had been used in describing him. Then he was asked to check every word which he felt was descriptive of himself. It was claimed that the test yeielded a measure of four basic vectors of behavior: aggressiveness, sociability, emotional stability, and social adaptability. Wallace, Clarke, and Dry (1956) investigated this procedure. They concluded that on the basis of results presented by 899 financial agents, the instrument had no validity for predicting the success of ordinary life insurance agents under the conditions of their study for first and second year performance.

Another study by Clarke (1956b) of 111 agents involving the AVA used one-year paid production as the criterion. It was found that the difference in terms of paid production was significant beyond the 1 per cent level for those rated good and poor salesmen by the AVA. When two different criterion levels were used ($281,000 and $200,000), the significant relationship between AVA predictions and paid production fell someplace between r = .42 and r = .53. The AVA was, furthermore, better able to select those successful salesmen who would stay in the life insurance business, as contrasted with those who appeared disinclined to make life insurance selling a career.

A carefully planned investigation by Merenda and Clarke (1959) studied characteristics of temperament as measured by the AVA. In addition, various personal history items were examined for their predictive efficiency in the selection of life insurance salesmen. The sample of 522 financial agents was studied three years from the time of hiring. Multiple criterion standards were established for each subject covering the three-year period of investigation. The conclusions were that applicants are not likely to be successful in life insurance sales if they see themselves as passive and submissive individuals rather than aggressive and socially confident. In addition, the authors contended that the AVA was a valid predictor of success or failure in selecting life insurance agents. Certain personal history measures were likewise found to be valid predictors of success or failure. Age, for instance, was seen to be predictive of failure in life insurance selling for those applicants whose ages were below and above certain minimum and maximum levels. Furthermore, the combined AVA and personal history data increased the

predictive power of these measures in determining the success or failure of life insurance agents over a sustained period of time.

The main intent of Merenda, Clarke, and Hall (1961) was to provide cross-validation for the AVA on the results of the study by Merenda and Clarke (1959) and to attempt to explain apparent discrepancies in the work of Clarke (1956b) and Wallace, Clarke, and Dry (1956). The cross-validation sample was composed of 535 ordinary life insurance agents. The AVA was administered and studied in conjunction with five personal-social history items contained in the application blanks completed by the salesmen before they were hired. A third predictor item was the age of the agent at the time of application. In this long-term study of successful and unsuccessful agents over a three-year period, the criteria were based on agent production and change of status within the company, and the volume of new business at the end of the first, second, and third years. The authors concluded that the data from this cross-validation confirmed the findings of Merenda and Clarke (1959). They reiterated that the AVA and certain personal history measures taken separately were valid predictors among life insurance agents. The predictive validity of age was, however, not upheld. It was also observed that the combined AVA and personal history data strengthened the power of each predictor in selecting those life insurance agents who would be successful over a period of time.

The "Adjective Checklist" was used by Kirchner and Dunnette (1958) to get a measure of the self-concept held by salesmen in the firm under investigation. Developed in the Minnesota Mining and Manufacturing Company by Dunnette, the checklist consisted of 36 groups of five

adjectives each. Those adjectives most alike in social desirability were placed together. The subject responded by choosing from each group the adjectives he regarded as most descriptive and least descriptive of himself. The authors felt that this more subtle approach forced an applicant to give objective answers rather than those which would make him "look good". Moreover, they reasoned that this procedure minimized the social desirability factor present in many personality inventories, and reduced the possibility of faking. Measures of selling effectiveness were obtained from the particular manager of each man in the sample. A group of 84 top salesmen was selected to be compared with 44 much less effective salesmen. Both groups had at least two years' experience.

The results of this study provided evidence that the two groups possessed distinctly different self-concepts. The top salesmen tended to select adjectives that had the "flavor of success" about them. Examples of such adjectives were: persistent, thorough, confident, successful, opportunistic, persuasive, and ambitious. The less successful salesmen chose such adjectives as unselfish, leisurely, and contented. Though worthy in themselves, perhaps, these latter descriptions seemed to have little direct contribution to success in selling. The authors believed that the better salesmen actually tended to see themselves as "salesmen". Less effective individuals appeared not to have identified themselves as clearly with the sales field.

The Adjective Checklist was used in a later investigation by Dunnette and Kirchner (1960) along with tests of interest, intelligence, and personality. A "Sales Job Description Checklist" developed by the

authors for the Minnesota Mining and Manufacturing Company, has successfully identified three kinds of selling jobs within the firm: Retail Selling, Industrial Selling, and Selling in General. The Check-list responses showed significant differences between the first two categories. The Industrial Salesman perceived himself as depending heavily for success upon ingenuity, inventiveness, and the exercise of his wits. The Retail Salesmen, on the other hand, described themselves as active, planful, hard-working, impatient, persuasive, non-scientific, and non-inventive. Both groups showed superior verbal reasoning ability as measured by the Wesman Personnel Classification Test. The Strong Vocational Interest Blank showed that the interests of both groups were directed towards sales, business, and personal contact occupations. The patterns of the two groups, however, differed substantially. For the Retail Salesmen, the patterns were strong in sales, independent business occupations, and persuasive areas. There was a marked aversion to scientific and problem-solving pursuits. The Industrial Salesmen patterns, on the other hand, indicated interests in scientific, technical, and problem-solving activities, and in general a less narrowed scope of interests. The Edwards Personal Preference Schedule marked the Retail Salesman as being consistently high in orderliness. For both groups, this latter test showed dominance to be related to success. Sales manager rankings on overall selling effectiveness constituted the criterion. The coefficients of correlations among various sets of rankings ranged from .50 to .80 with a median value of .74. The authors considered that the analysis had provided data for

identifying successful salesmen in this particular firm. It would seem that certain group characteristics are required to handle different products and to meet the demands of different selling jobs within the same company, including the encountering of many different kinds of customers.

The purpose of the research reported by Dunnette, Kirchner, and DeGidio (1958) was to compare the Edwards Personal Preference Schedule (EPPS) with the California Psychological Inventory (CPI) and each, in turn, with eleven occupational area scores obtained from the Strong Vocational Interest Blank (SVIB). The sample of 102 employees of the Minnesota Mining and Manufacturing Company included 38 salesmen. The authors claimed that the trend of the relationships among the variables made good "clinical sense" and that correlations between scales were generally in the expected directions. For example, occupational interests involved with sales, verbal, and personal contact activities showed positive association with dominance, sociability, and social presence on the CPI. The SVIB for sales scores alone correlated .39 with dominance, .41 with sociability, .31 with social presence, .33 with self-acceptance, .22 with a sense of well-being, and .26 with the good impression scale. These coefficients were all significant at the 1 per cent level with the exception of well-being, which is significant at the 5 per cent level. A negative correlation (-.21) appeared for the psychological-mindedness scale.

The SVIB sales grouping correlated significantly with the dominance and exhibition scales of the EPPS, and negatively with autonomy.

It would be interesting to compare the CPI and EPPS scales with a larger group of salesmen than was used in this sample.

Extensive data drawn from many tests were collected by Rodgers (1959) on a small sample of twelve route salesmen for a food company. Rodgers found in general that this group of salesmen was characterized by an absence of strongly-held personal opinions, an interest in the possession of material things, and a distrust of people concealed behind a facade of congeniality. It was felt that such factors assisted the salesmen in successfully manipulating relationships in such a way as to sell the product without genuine concern for the best interests of the customer. It is worthwhile commenting that some of these impressions would very likely be supported by McMurry (1961).

Miner (1962) attempted to isolate effective predictors in salesmen selection, and to study some of the personal characteristics affecting job performance. He utilized a battery of interest, ability, and personality tests. The ability tests were:

The Terman Concept Mastery Test

The Vocabulary Test G-T, Forms A and B (each containing 20 multiple-choice items)

The Wesman Personnel Classification Test, Form A, Part II (Numerical)

The Survey of Mechanical Insight

The Wechsler Adult Intelligence Scale (WAIS) subtests as follows: Information, Comprehension, Arithmetic, Similarities, and Digit Span

The personality and interest measures were:

The Kuder Preference Record-Vocational, Form CM

The Tomkins-Horn Picture Arrangement Test (PAT)

The Thematic Apperception Test

A sentence-completion measure of attitude toward various aspects of the supervisory job devised by Miner.

The subjects of Miner's study were 65 salesmen of a major oil company. Their duties included recruiting dealers to operate service stations and through working with these dealers to increase the sales of company products to the public. Objective criterion measures were carefully developed using sales figures over a four-year period. Initial relationships between test scores and criterion were computed on a representative sample of 21. The balance of the group of 65 was used to cross-validate any measure in the smaller sample which was even slightly significant.

The results after cross-validation indicated that only the WAIS Arithmetic subtest and the PAT were valid predictors of success in the company studied. It is interesting to observe that the WAIS Arithmetic subtest, which required the applicant to solve problems orally, predicted sales success, while the Wesman Numerical test involving written calculation, did not. It was ventured that a factor in successful selling resided in the necessary confidence involved in making rapid calculations in face-to-face situations. It was reported that four out of five men with positive scores on the PAT were above-average salesmen, while only about one man in twenty with negative scores was equally successful. Furthermore, it was found that for salesmen in the sample of 65, the special PAT measures of dependence, sociophilia, self-confidence, and happiness were associated with success. On the other hand, aggression, sociophobia, and strong superego characterized poor sales performance.

Projective Techniques in the Selection of Salesmen

Projective techniques have not been widely used in the selection of salesmen. Studies employing the sign technique with the Rorschach have not really proved very fruitful.

Harrower and Cox (1942) administered a group Rorschach to 83 persons, including 11 insurance salesmen. Some tentative conclusions were drawn from this small sample. In the first place, the salesmen's profiles gave evidence of considerable drive, but spontaneous and creative expression was inhibited (low M, high F, moderate FC). The salesmen ranked with artists as being least systematic in their approach to problems. Furthermore, the low number of human movement responses suggested that although an essential aspect of the agent's job is dealing with people, his interest in them is really not a personal one (Roe, 1956).

Sometime later, Cox (1948) administered the Harrower-Erickson multiple-choice Rorschach to 108 department store sales personnel of known ability. The subjects were ranked by department managers in terms of sales record and sales capacity. Careful substantiations of ratings were made in conference with the author. The data were handled by means of item analysis to see if there were significant differences between the top and bottom groups, each representing 25 per cent of the total group. Personality patterns for each were delineated and the store managers agreed that they were "fairly accurate personality descriptions of the satisfactory and unsatisfactory type of sales people." Subsequent observations of personnel in action confirmed the interpretation of the findings. This study was criticized by Kurtz (1948) who

declared that the method used was useless until it could be proven valid for other groups.

Kurtz (1948) presented evidence that the Rorschach failed miserably as a predictor of success for life insurance sales managers. Toward this end, a complicated scoring procedure, involving 32 "signs" was developed by several Rorschach "experts". The system was used in a repeat experiment with good and poor managers. According to Kurtz, the Rorschach correlated lower with success than almost any other device used in the selection procedure. Kurtz reviewed other selection investigations using the Rorschach, for the most part involving military personnel, and concluded that the Rorschach was of no practical value in selection at that time.

Rieger (1949a) used the individual Rorschach in conjunction with a management consulting firm's[1] regular selection procedure based on a Patterned Interview technique. Ratings on 30 people were made by an interviewer and the Rorschach worker using their respective techniques. The positions being considered were at the executive level and included three sales jobs. The correlation between the two sets of ratings was .75. A second study (Rieger, 1949b) of several occupational groups showed a few statistical differences between groups using individual Rorschach data. The author described the most important distinction as being the salesmen's greater ability to deal with verbal concepts as contrasted with the supervisors' and foremen's skill in this area.

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1. Robert N. McMurry & Co., Chicago, Illinois.

It was observed in both cases that the Rorschach was especially useful at higher occupational levels. The recommendation was made that it be used together with other selection procedures. Furthermore, it was emphasized that the administrator be highly qualified and experienced in the Rorschach technique.

Kurtz (1948) quoted Klopfer (1946) as saying that the Rorschach was not useful as a screening device in selection for particular types of jobs. Unfortunately, Kurtz did not elaborate sufficiently on this point. Klopfer affirmed that attempts to employ the "sign" method of Rorschach interpretation as a screening device for particular jobs had proved unsuccessful. He explained, however, that the Rorschach was not a mechanical scaling device. It is not the kind of instrument the data of which can be totalled up by inexperienced clerks. Indeed, a careful "global" interpretation is required based upon a considered integration of response material and scoring summaries. Obviously this kind of test does not lend itself to prediction based upon statistical processing. When used along with different selection tools, it may assist in the understanding of other test results and help in their application. Klopfer believed that when such a detailed picture of the applicant was compared with a complete assessment of the job description and situation, "striking successes" in selection and consequent reduction of turnover were obtainable.

A so-called projective technique using the Worthington Personal History form (WPH) was reported by Spencer and Worthington (1952). The WPH was given to 129 salesmen employed during a specified six-month period. In its employment application blank form, it was not

thought of by applicants as a test. The design of the blank offered an opportunity for unstructured responses. The items were analyzed according to dynamic psychological theory, possibly involving some speculation. The authors claimed that a composite picture of the individual emerged from the overall consideration of the person's self-feeling, his behavior, his ways of relating to himself, to other people, and to the job. They warned against taking interpretations out of context. The forms were evaluated by Worthington Associates Incorporated and rated in terms of the job as above average, average, below average, and poor. These ratings were then compared with tenure and sales recorded for the period of one year from the beginning employment date of each salesman. It was concluded that the WPH technique was a valid instrument for predicting the effectiveness of salesmen for this particular firm. A biserial correlation of .34 was obtained with tenure, and .31 with sales volume. Cross-validation was said to be in progress.

Clark and Owens (1954) compared the WPH blank with objective test results on 47 employees of a publishing firm. They found that neither method related significantly to the criterion ratings. The objective test findings, however, were reported as being more closely related to the ratings as contrasted with the WPH results. On the basis of this information, the authors affirmed that the use of the WPH procedure was not warranted.

Peck and Stephenson (1954) criticized the contention of Clark and Owens (1954). They observed that the criterion reliability in the latter study was an unknown quantity. It was furthermore pointed out that the WPH measures the interaction of traits. Inasmuch as the Clark

and Owens work did not choose instruments to take a similar measure, Peck and Stephenson suggested that the study had not really been designed to test fairly the validity of the WPH.

It might also be added that in the employment of a technique such as the WPH, a great deal depends upon the interpretive skill of those making the final evaluation. This method depends greatly upon the interpreter element. It is obvious that differences in background, experience, and understanding amongst interpreters will account for or contribute to differences in results. The WPH probably shows some promise as a selection technique, and were it not for the fact that it takes a fairly advanced person to make the interpretation, it would possibly be more widely used.

The foregoing coverage leads quite naturally into the present study.

Statement of the Problem and Hypothesis

The Problem:

The literature concerned with salesmen selection leaves little doubt as to the importance of personality characteristics in sales occupational success (Johnson, 1957; Mandell, 1955; McMurry, 1944; McQuaig, 1949; Moore, 1942; Phelps and Howard, 1960; Roe, 1956). Moreover, Shartle (1959) was prepared to argue that interests are in fact indirect measures of personality reflecting the subject's needs and aspirations. Mandell (1955) said that personality factors may be more important to success in selling than pronounced interest in selling. He pointed out,

however, that interest inventories may generally give better results because they are for the most part better measuring instruments, rather than because what they measure is more important. In reviewing the sales selection problem, Moore (1942) supported the common view that personality traits should be given more weight than ability measures in selecting salesmen. Cleveland (1948) considered that success accruing to a salesman in a job entailing a considerable amount of social contact, appeared to rest upon an optimum combination of so-called personality factors rather than exceptional mental astuteness.

Implicit in many studies has been the assumption that the same personality characteristics may always be associated with high order sales ability regardless of the product sold, the type of customer contact, the milieu in which the salesman must operate, or other situational factors. The rather negative results obtained in many investigations make the foregoing assumption appear to be something less than valid. Furthermore, significant results obtained in one situation, may be found inadequate in cross-validation work in the same or another establishment. Again, it cannot be presumed that high test scores alone will select the most efficient applicant in the sales field. Although persons employed in a specific job may be outstanding in certain characteristics, as measured by different personality tests, such characteristics may not be of the greatest importance to the successful accomplishment of the work involved. Thus it may be said that personality factors are related to occupational success in proportion to the job demands. Furthermore, the level of adequacy attained in the sales job may be related to various strengths and integrations

of traits in the salesman's personality make-up.

Inasmuch as no one personality factor is synonymous with success or a certain index of failure (Moore, 1942), a composite pattern of traits as well as the range of effectiveness would seem to be a realistic goal of personality measurement. Indeed, the concept of "sales ability" has shifted increasingly to the notion that "salesmanship" depends upon some sort of social behavioral pattern. The difficulty is to find a measuring instrument which will most validly appraise the pattern of personality variables presumed necessary in a specific selling situation. The problems of demonstrating that objective personality measures can predict success in specific occupations has been discussed in an earlier section. (See also Moore, 1947; Rundquist, 1950).

One of the problems in the present study was to choose a personality test which would measure those characteristics believed to be necessary in successful selling. In resolving this problem, it was kept in mind that the test would need to be directly related to social behavioral patterns, inasmuch as these aspects were judged to be fairly basic to success in selling. In addition, the test chosen had to be relatively brief and convenient to administer. The California Psychological Inventory (Gough, 1957) was considered to fulfil these requirements.

The Hypothesis:

The aim of this study then was to investigate the value of the California Psychological Inventory (CPI) in distinguishing between successful and unsuccessful salesmen. It was hypothesized that there

would be a significant difference in the means of the two groups favoring the successful salesmen on those CPI scales which measure personality attributes supposedly related to social behavioral patterns. Specifically, significantly higher scores were anticipated for the successful salesmen on the following scales: Do (dominance), Cs (capacity for status), Sy (sociability), Sp (social presence), Sa (self-acceptance), and Wb (sense of well-being). In addition, it was expected that the Py (psychological-mindedness) scale would show a similar difference.

Fundamental to these considerations, is the assumption that the test is of value in differentiating between salesmen and non-salesmen. This last-mentioned aspect, of course, is not under study in the present work.

CHAPTER III

PROCEDURE

Description and Administration of the Test

The assessment instrument used in this study was the California Psychological Inventory (Gough, 1957). This self-administering test has 480 true-false items. The directions appear on the booklet cover:[1]

> This booklet contains a series of statements. Read each one, decide how you feel about it, and then mark your answer on the special answer sheet. MAKE NO MARK ON THE TEST BOOKLET. If you agree with a statement, or feel that it is true about you, answer TRUE. If you disagree with a statement, or feel that it is not true about you, answer FALSE. In marking your answers on the answer sheet, make sure that the number of the statement is the same as the number on the answer sheet. Be sure to answer either TRUE or FALSE for every statement, even if you have to guess at some.

The answer sheet for each subject was scored using the California Psychological Inventory hand-scoring key. The raw scores thus obtained were transferred to individual profile sheets[2] yielding standard scores. No time limit is set for this test and it is usually completed within 50 to 60 minutes.

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1. See Appendix "A(i)"
2. See Appendix "A(ii)"

In both individual and group administrations, the California Psychological Inventory (CPI) and the Strong Vocational Interest Blank were given as part of a larger project relating to assessment of sales personnel. Since the emphasis of the present study was to be placed upon personality characteristics related to selling rather than interest, the discussion of procedure as well as results will center upon the CPI.

Description of the Criterion

All persons included in this study were salesmen employed by a local investment firm with branch offices throughout Canada and the northwest United States. The total sample consisted of 118 salesmen. The success criterion was established in terms of sales contacts, presentations, gross average monthly sales, retention of business, and careful ratings made by the two company officers most closely in touch with sales staff proficiency. The above variables all contributed something to the overall individual rating of worth to the company. Doubtful cases were investigated rather thoroughly and evaluated carefully. Indeed, several high ranking producers had to be dropped from the sample for unacceptable sales practices. A preliminary analysis of reliability and comparability of managers' ratings showed good consistency. Ratings appeared valid inasmuch as there was solid agreement between ratings and selling records. Thus it was felt that some confidence could be placed in the criterion measure.

After due consideration of all the factors, the executive officers of the company submitted a list of all the names arranged in

order from the most successful to the least successful salesman. Centered about an arbitrary figure of gross monthly sales a Middle Group composed of 60 names was identified. Further refinements substantiated by thorough checking drew out a Top Group of 28 very successful salesmen and a Bottom Group of 30 unsuccessful salesmen. In the Bottom Group several of the salesmen tested were terminated after only a few months employment. Thus, these individuals were actual "failures on the job." The terminations were specifically the result of poor sales ability rather than for other reasons. It was judged that the two groups were significantly different in sales proficiency and that there were enough subjects in each group to make the project worthwhile. The task of the present study was to discover whether or not personality patterns elicited by the CPI would significantly distinguish one group from the other.

Description of the Sample Group

An attempt was made to match the groups in terms of age, education, and length of service with the company. From other sources within the general assessment project it was apparent that the groups were well matched insofar as mental development (intelligence) was concerned.

The age range in the Top Group varied from 26 to 57 with a mean age of 38.3 years. In the Bottom Group the age range was from 25 to 59 and the mean was 37 years. The Total Group ranged in age from 25 to 59 with a mean of 38.5 years.

TABLE I

AGE RANGE, MEAN AND STANDARD DEVIATION OF
TOTAL GROUP AND SUB-GROUPS

	N	Age Range	Mean	S.D.
Top Group	28	26-57	38.3	8.2
Middle Group (excluded)	60	25-58	39.3	8.2
Bottom Group	30	25-59	37.0	8.8
Total Group	118	25-59	38.5	8.4

It can be seen from Table I that the matching requirements have been met so far as age is concerned.

Education in the Top Group ranged from 8 to 14 years with a mean of 10.9 years. In the Bottom Group the educational range was from 7 to 16 years and the mean was 11.4 years. The Total Group ranged in education from 7 to 19 years with a mean of 11.1 years.

TABLE II

EDUCATIONAL BACKGROUND
RANGE IN YEARS, MEAN, AND STANDARD DEVIATION OF
TOTAL GROUP AND SUB-GROUPS

	N	Range in Years	Mean	S.D.
Top Group	28	8-14	10.9	1.6
Middle Group (excluded)	60	7-19	11.1	2.2
Bottom Group	30	7-16	11.4	2.2
Total Group	118	7-19	11.1	2.1

It is of interest to note that the educational range in the Total Group was from seven years of formal schooling to seven years of university. Inspection of Table II reveals, however, that the groups were well matched with regard to education.

The length of service with the company for the Top Group individuals varied from 5 to 69 months with a mean of 23.7 months. In the Bottom Group the range of service was 4 to 64 months and the mean was 22.0 months. The Total Group ranged from 3 to 69 months with a mean of 24.0 months.

TABLE III

LENGTH OF SERVICE
RANGE IN MONTHS, MEAN, AND STANDARD DEVIATION OF
TOTAL GROUP AND SUB-GROUPS

	N	Service in Months	Mean	S.D.
Top Group	28	5-69	23.7	15.7
Middle Group (excluded)	60	3-60	25.2	14.6
Bottom Group	30	4-64	22.0	16.0
Total Group	118	3-69	24.0	15.3

In relation to the matching of groups, Table III shows that the groups appear to be directly comparable on the length of service factor.

The Relevance and Value of the California Psychological Inventory in this Study

At this point it appears reasonable to consider the rationale of the CPI. In the original work with this test, the goal was to "develop descriptive concepts which possess broad personal and social relevance" (Gough, 1957, p. 7). The 18 CPI scales were intended to assess personality characteristics which were thought to be more important for understanding "normal" behavior than are the traits sampled by a test such as the Minnesota Multiphasic Personality Inventory. This last mentioned test is perhaps more useful in describing pathological conditions and maladjustment syndromes. Gough declared that the CPI scales are "addressed principally to personality characteristics important for social living and social interaction." Because in ordinary behavior there is always a dynamic interaction amongst various traits, Gough emphasized the importance of interpreting the test in terms of interaction among the scales. Behavior is a complex matter. The CPI must not be considered as an instrument that provides interpretation in a mechanical way. The author of the test indeed emphasized that the amount of information provided in an interpretation of the CPI profile is, as with any psychological test interpretation, "a function of the comprehensiveness and adequacy of the instrument; of the general background and skill of the interpreter; and of the user's knowledge of and experience with the test itself." (Gough, 1957, p. 11).

The 18 scales are grouped into four broad categories or

Classes.[1] Such categorization is more in the nature of an aid in interpretation than an empirical grouping (Siegel, 1958). Both Siegel and Shaffer (1957) viewed the CPI as a major achievement and an important contribution to the testing repertoire. Because of its emphasis on how an individual relates to his social environment, it was evaluated as having extremely practical application in vocational and industrial settings. On the other hand, Thorndike (1959) contended that data provided on the separate scales did not allow reliable appraisal of their uniqueness. He felt that the scales represented a redundant, inefficient, and confused picture of the individual personality. In the field of psychological testing, it is not especially unusual to have such conflicting views presented by different reviewers.

For the purpose of the present study, the CPI was considered to be a useful instrument because of its emphasis upon the social behavioral pattern and because of the 18 trait scales allowing for a refined assessment. Not only are the 18 traits of specific value, but the dynamic interplay amongst the various Classes was thought to allow for an increased understanding of intra-personality functioning in the broader terms of social expressive behavior, conscience, intellectual achievement and potential, and other subtle aspects. Thus, in a sense, there are at least these two dimensions of measurement derived from this test. The fact that the CPI was intended for usage with normal individuals makes it especially valuable for application to those persons who are functioning in the selling situation.

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1. See Appendix "A(iii)" for Scale names and Class groupings.

CHAPTER IV

RESULTS

In a preliminary investigation of data the 28 subjects in the Top Group and the 30 subjects in the Bottom Group were studied separately. The raw scores for each scale were used. Because of the relatively small numbers in this study, a formula for small sample statistics was used. Means and standard deviations[1] were calculated separately on each scale for both groups.

Comparison of the Top Group mean with that of the Total Group mean[2] profile (Figure 1)[3] revealed higher scores for the Top Group on 15 of the 18 characteristics measured. The Total Group exhibited slightly higher scores for Sc (self-control, Gi (good impression), and Cm (communality). Similar comparison of the Bottom Group with the Total Group profile (Figure 2)[3] showed the former to be lower on all scales with the exception of So (socialization), Sc (self-control), and Gi (good impression). Comparison of the Top Group and Bottom Group mean profiles (Figure 3)[3] showed the expected discrepancies between the two samples. The former exceeds the latter on all scales with the exception of So (socialization), Sc (self-control), Gi (good impression), and Cm (communality). The two means coincide on the Fe (femininity) scale. Table IV presents the means and standard deviations for all three groups.

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1. See Appendix "B(i)" for formulae (Ferguson, 1959, Ch. 3 & 10).
2. Data processed by University of Alberta computer.
3. See Appendix "D".

TABLE IV

MEANS AND STANDARD DEVIATIONS;
TOTAL GROUP, TOP GROUP, AND BOTTOM GROUP
FOR SCALES OF THE CALIFORNIA PSYCHOLOGICAL INVENTORY

SCALE	MEAN			STANDARD DEVIATION		
	Total Group	Top Group	Bottom Group	Total Group*	Top Group	Bottom Group
Do	31.7	33.1	30.2	4.8	4.43	4.97
Cs	21.4	22.2	20.5	3.5	3.06	4.34
Sy	27.7	29.4	26.6	3.8	3.11	4.11
Sp	37.4	39.3	35.5	5.2	4.79	6.04
Sa	23.2	23.7	22.5	2.9	2.68	3.08
Wb	38.9	40.3	37.9	3.6	2.66	3.83
Re	29.9	30.6	29.4	4.4	3.05	4.76
So	36.4	36.5	38.1	4.6	4.21	3.89
Sc	28.8	28.2	30.0	7.1	7.40	4.95
To	22.4	23.6	21.9	4.5	3.74	4.67
Gi	20.1	19.8	20.6	6.4	7.39	6.20
Cm	26.7	26.5	26.6	1.3	1.50	1.22
Ac	28.9	29.9	28.4	4.2	3.53	4.25
Ai	17.0	17.8	16.7	3.8	3.43	4.03
Ie	39.0	40.5	37.5	4.6	4.12	5.86
Py	11.0	11.7	10.1	2.4	2.26	2.58
Fx	6.6	6.9	6.3	3.5	3.48	3.48
Fe	16.7	16.9	16.9	3.4	4.16	3.42

Total Group N = 118
Bottom Group N = 30
Top Group N = 28

* Data processed by Computer at University of Alberta to one decimal place.

An examination of Figure 3 in terms of Class differences, revealed that the Top Group had higher average standard scores than the Bottom Group in Class I (Measures of Poise, Ascendancy, and Self-assurance), Class III (Measures of Achievement Potential and Intellectual Efficiency), and Class IV (Measures of Intellectual and Interest Modes). The standard score average for Class I was 59.3 which is approximately one standard deviation above the normal average. The Bottom Group standard score average was 55.0 even. The average for the Top Group in Class III was 52.3 while the Bottom Group was 48.6 which is somewhat below the normal. In Class IV the Top Group was at the normal average of 50, while the standard score average of 46.3 again placed the Bottom Group below the normal. The standard score averages are approximately equal for both the Top and Bottom Groups in Class II. It is noteworthy that the Top Group was almost one standard deviation lower on this measure than in Class I.[1]

Although inspection of Figure 3 indicated that there were indeed differences between the Top and Bottom Groups, the hypothesis concerned with this study assumed that the Top Group means for certain scales would be significantly greater than the Bottom Group means. Accordingly, statistical procedures[2] were carried out to determine if significant differences existed between the two groups. The procedure involved combining the data for the two samples to obtain the best

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1. See Appendix "C" for calculation of standard score averages according to Class divisions.

2. See Appendix "B(ii)" for formula and general statistical procedures (Ferguson, 1959, Ch. 10).

unbiased estimate of the population variance. The "t" technique was employed to determine whether or not there were significant differences between the mean scores on the 18 CPI scales for the Top and Bottom Groups. A two-tailed test of significance was used. Although the hypothesis assumed that certain scale means of the Top Group would be significantly greater than those of the Bottom Group, there was some uncertainty about the direction of differences for the rest of the scales.

Table V presents the means and standard deviations for the Top Group and for the Bottom Group on each scale, and, in addition, the results of the "t" test used to determine the significance of differences between the means on each scale for the two groups.

As can be seen from this tabulation, the hypothesis was largely verified, and one unexpected finding emerged. The mean of the Do (dominance) scale distinguished the Top Group from the Bottom Group at better than the .05 level of significance. The Sp (social presence) and Py (psychological-mindedness) mean differences were significantly higher for the Top Group at the .02 level. Furthermore, the mean difference for Sy (sociability) and Wb (sense of well-being) reached the .01 level of significance. It was not expected that a significant difference would show up on the Ie (intellectual efficiency) scale. It was found, however, that the Top Group mean on this scale was significantly greater than the Bottom Group mean at the .05 level. The hypothesis was not confirmed with regard to the Cs (capacity for status) and Sa (self-acceptance) scales.

TABLE V

MEANS, STANDARD DEVIATIONS, AND "t" TEST RATIOS;
TOP GROUP AND BOTTOM GROUP FOR SCALES OF THE
CALIFORNIA PSYCHOLOGICAL INVENTORY

SCALE	MEAN		STANDARD DEVIATION		"t" RATIO	SIGNIF. LEVEL	C & C
	Top Group	Bottom Group	Top Group	Bottom Group			
Do	33.1	30.2	4.43	4.97	2.339	*	
Cs	22.2	20.5	3.06	4.34	1.735	N.S.	c
Sy	29.4	26.6	3.11	4.11	2.917	***	
Sp	39.3	35.5	4.79	6.04	2.657	**	c
Sa	23.7	22.5	2.68	3.08	1.579	N.S.	
Wb	40.3	37.9	2.66	3.83	2.791	***	c
Re	30.6	29.4	3.05	4.76	1.154	N.S.	c
So	36.5	38.1	4.21	3.89	-1.509	N.S.	
Sc	28.2	30.0	7.40	4.95	-1.078	N.S.	c
To	23.6	21.9	3.74	4.67	1.532	N.S.	
Gi	19.8	20.6	7.39	6.20	-0.447	N.S.	
Cm	26.5	26.6	1.50	1.22	-0.278	N.S.	
Ac	29.9	28.4	3.53	4.25	1.456	N.S.	
Ai	17.8	16.7	3.43	4.03	1.117	N.S.	
Ie	40.5	37.5	4.12	5.86	2.273	*	c
Py	11.7	10.1	2.26	2.58	2.504	**	
Fx	6.9	6.3	3.48	3.48	0.656	N.S.	
Fe	16.9	16.9	4.16	3.42	0.000	N.S.	

Top Group N = 28
Bottom Group N = 30
Degrees of Freedom = 56 in each case

* p .05
** p .02
*** p .01

N.S. - not significant

c: Cochran and Cox correction formula applied when the F test indicated heterogeneity of variance (Ferguson, 1959, Ch. 10).

Note: the observed values of "t" were assessed from Table B (Ferguson, 1959, p. 308). Two-tailed tests of significance used.

CHAPTER V

DISCUSSION OF RESULTS

The Total Group profile of 118 salesmen was compared with norms for various adult business occupations given in the CPI Manual (Gough, 1957, p. 34). The Total Group means were very similar to those for Salesmen (N = 85) with the exception that the latter exhibited relatively higher means on Re (responsibility), Sc (self-control), and To (tolerance). It is thought that such a discrepancy may be due to the fact that the Salesmen norms in the Manual were actually established on regional sales supervisors[1] who would presumably not have achieved such positions without an adequate degree of responsibility, self-regulation and maturity. It is quite possible that this characteristic could be developed on the job and indeed would be a prerequisite for advancement.

When the various Classes of scales were examined separately, some illuminating results appeared which characterized the Total Group as a distinct sales entity. In the area of poise, ascendancy, and self-assurance (Class I) the Total Group standard score average was almost similar to the Manual norms for Salesmen (N = 85) and Military Officers (N = 343) but somewhat above those are Bank Managers (N = 25) and Business Executives (N = 107). Of interest here, this would seem to indicate an emphasis on, and a need for, highly developed social skills and social interaction within a sales group.

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1. Gough, H. G. Personal communication. 1962.

For measures of socialization, maturity, and social responsibility (Class II) the Total Group standard score average was lower than that for Manual Salesmen, Bank Managers, and Military Officers. It might be said, then, that the Total Group of salesmen in this study have not internalized societal demands (Gough, 1960) to a high degree and may exhibit tendencies (or potential) toward somewhat immature, "unsocialized", and impulsive behavior.

In consideration of achievement potential and intellectual efficiency (Class III) the Total Group average was lower than any of the Manual norms examined. As might have been expected, the Bank Managers were rather higher in this respect. Thus it may be inferred comparatively that achievement by means of conformity, independence, and superior intellectual efficiency are not essential characteristics of a sales group in as high degree, perhaps simply because such attributes are not always necessary for adequate performance on the job.

In respect of measures of intellectual and interest modes (Class IV) the Total Group was much like that of Manual Salesmen, and together were lower than Bank Managers, Business Executives, and Military Officers. It may be that the lower standard score average for salesmen is a function of their rigidity and narrowed interests. This, in turn, may indicate that they would have difficulty in adaptive thought and behavior except in their own spheres.

Aside from the Total Group comparisons discussed above, the 28 Top Group salesmen provided additional information. In Class I the Top Group had a <u>higher</u> standard score average than any of the

other groups mentioned. The Top Group average in Class II showed minimal variation with that of the Total Group, the Bottom Group, and the Military Officers, but was indeed lower than any of the other Manual "business" occupational norms compared. In a further examination of low-scoring groups (Class II) as seen in the Manual, it was revealed that only Prison Inmates (N = 194 presumably adults), Psychiatric Hospital Patients (N = 26 presumably adults), and Young Delinquents (N = 142) were considerably (5.2 points) to greatly (12.5 points) lower than the standard score average of the Top Group in Class II. In Class III the Top Group was very similar to Manual Salesmen, Business Executives, and Military Officers, but lower than Bank Managers. Class IV showed the Top Group to be like the Manual Salesmen, and Military Officers, but somewhat lower than Bank Managers and Business Executives. The general interpretation offered earlier, it will now be seen, has been brought out more clearly by the Top Group, as it appears to have accentuated some of the extremes. It is interesting to note the emphasis exhibited by the Top Group on those scale measures involved with social skills (Class I), inasmuch as this was predicted hypothetically from the very beginning. It is almost as interesting to note as well, the somewhat lower scores in the successful group on measures of socialization (Class II).

It was pointed out earlier that the Top Group exceeded the Total Group salesmen (Figure 1) except on three Class II scales. In addition, the Total Group had higher scores in general than the Bottom Group (Figure 2) except on three Class II scales. It can be said that

there is very little difference amongst the three groups in Class II. Moreover, the average for that Class would appear to strike upon the standard average for the general population. This would suggest that these groups are neither overly moralistic and controlled nor extremely unprincipled and impulsive. In fact, the Top Group to be consistent should be higher in Class II. That it is not suggests it is really "lower" and that these qualities for this group may be somewhat more accentuated. An outlook such as this in terms of the "conscience factor" supposedly involved, coupled with the notable skills exhibited in the Class I, especially by the Top Group, would lead one to think that these individuals are free to interact socially because of their middle-of-the-road thinking. With this greater perspective it is entirely possible that they are within range of being able to exhibit the viewpoints of both of the extremes mentioned. This may enhance the facility, owing to the comparable lack of inhibition, by means of which larger amounts of energy can be released into social interactional behavior.

The main differences between the Top Group and the Bottom Group (Figure 3) resided in Classes I, III, and IV. The Top Group had an advantage over the Bottom Group in social skills. The individuals in the former group should be action-oriented, sharp-witted, spontaneous and resourceful, aggressive, competitive, and persuasive. Furthermore, the successful salesmen may be better able to organize and plan an efficient work program. Again they are more perceptive in dealing with people and situations, and are more verbally

fluent. As a group the less successful salesmen showed somewhat lower social interactional skills, which might be the result of their being inhibited by cautious, less planful behavior, or an easy-going, less ambitious attitude. The thought that the Bottom Group as well as the Top Group would have the advantage of lessened inhibition and yet does not have the superior social interactional skills would incline one to the interpretation that they may be lacking in energy, or otherwise involved with lesser abilities (for example, low intellectual effectiveness, low perceptiveness, and the like). Thus is seen the importance of factors such as energy and development. On the other hand, the energy and development of these individuals in the Bottom Group may be diverted into unknown areas not touched by the test inventory.

The differences between the Top and Bottom Groups have been discussed in a general way. There were, however, six scales (Do, Sy, Sp, Wb, Ie, Py) that statistically separated the two groups. Supporting the hypothesis that the Top Group would exceed the Bottom Group on measures of poise, ascendancy, and self-assurance (Class I), it was found that, in fact, four of the six scales were significant in this regard. Again supporting the hypothesis, the Py (psychological-mindedness) scale also showed a significant difference. In addition, though unexpected, the Ie (intellectual efficiency) scale, while not especially high in itself for the Top Group, was significantly different from the Bottom Group.

These six scales might be viewed as an hierarchy of traits in accordance with their levels of significance (see Table V). Looking at the results in this light, Sy (sociability) and Wb (sense of well-being)

scales would appear to be the most important test attributes for success in selling in the firm involved. These factors would identify the successful salesman as being the kind of person who enjoys group activities and likes to be with and work with other people. In addition he would be relatively free from self-doubt, and would seem to be able to enjoy life, indicating physical and emotional well-being and comfort. In contrast, the Bottom Group individuals would exhibit fewer of these characteristics. Beyond that, especially in interpersonal relationships, they might also be somewhat inclined toward caution and constriction in thought and behavior. At this point another attempt might be made to answer the question as to why the Bottom Group does not appear as able to liberate energy into social interactional behavior as does the Top Group. Drawing upon the evidence related to the Wb (sense of well-being) scale, it would appear that the Top Group individuals are less self-concerned. Worry over the self has the unfortunate tendency to absorb energies which might otherwise be used constructively for external (social interactional) purposes. The Bottom Group is evidently more involved with this self-centered activity.

The second level in the hierarchy of distinctive traits included the Sp (social presence) and Py (psychological-mindedness) scales. The former would mark the Top Group individuals as being enthusiastic, expressive, confident, and full of ideas. The Bottom Group on this scale would describe the less successful salesmen as being more restrained, uncertain, vacillating, and somewhat lacking in interactional adequacy when compared with his more successful

counterpart. It is possible that this can be explained in terms of the relative positions of the Do (dominance) and Sa (self-acceptance) scales, the latter of which is relatively higher for the Bottom Group. This might indicate a tendency toward lessened forcefulness because of increased self-absorption. The Py (psychological-mindedness) scale is not sufficiently high for the Top Group to suggest intensified sympathy of outlook. It is more likely to be a measure of practical empathy. A reasonable interest in, and responsiveness to people, probably contributes to and complements interactional adequacy.

The lowest level of the success hierarchy is composed of the Do (dominance) and Ie (intellectual efficiency) scales. The former showed the highest score for the Top Group profile. From this would derive the expectancy that a person on this level would exhibit good ego strength, persuasiveness, planfulness, and persistence. In addition, high scorers are supposedly cause-involved and action-oriented. Furthermore, they have a need to discharge energy and should be good leaders and organizers (Gough, McClosky, and Meehl, 1951). The moderately high score on Ie (intellectual efficiency) may allow for the better direction of the superior ability of the Top Group as compared with the Bottom Group.

Something might be said regarding the two scales in Class I on which significant differences were hypothesized but not verified. When considering the Top and Bottom Groups, it should be remembered that both samples had been pre-selected as salesmen. It was to be expected, therefore, that similarities as well as differences would exist.

Both groups scored above the average on the Cs (capacity for status) and Sa (self-acceptance) scales. Indeed, the Top Group was noticeably higher on the Cs (capacity for status) scale (nearly at the .05 level of significance) than was the Bottom Group. This may describe the greater potential in the Top Group for advancement to higher managerial levels. The high scores and minimal discrepancy for both groups on the Sa (self-acceptance) scale indicate confidence, self-assurance, and a sense of personal worth. It might be said that the high score on the Wb (sense of well-being) scale for the Top Group supports the reality of the Sa (self-acceptance) score for the individuals in this group. On the other hand, the lowered Wb (sense of well-being) score for the Bottom Group may mean that these individuals have doubts about their performance in social interactional situations. Thus a high score on Sa (self-acceptance) would have to be explained as compensatory rather than genuine.

It has been pointed out that certain scales on the CPI do differentiate between successful and less effective salesmen. It should also be evident that the whole pattern must be considered. Personality traits do not exist as isolated entities but they function in an integrated way. Tests which take into account many dimensions of personality should give better predictions than are obtainable from single scale tests (Cattell, 1956). The CPI seems to tap a range of thoughts, attitudes, and convictions. If thought and attitude trends can be identified, behavior potential should be predictable.

Description of the Successful Salesman for the Firm Involved in this Study

At this point, a thumb-nail sketch might be drawn of the successful salesman for the firm involved. He would first of all be confident, assured, and at ease in interpersonal business relations. Dominance would be an important dimension of social participation. Highly developed social interactional skills would allow him to be inoffensively persuasive in direct client negotiations. Furthermore, this strongly self-confident salesman, would derive real satisfaction out of meeting difficult challenges. Freedom from self-doubt and disillusionment would provide him with an air of being able to enjoy life and a sense of well-being. He would not be overly conscience-bound or involved with ethical issues. In addition, he would be somewhat emotionally uninhibited. Easy interaction with a wider variety of customers would thus be facilitated. Sufficient intelligence to handle the job demands would be a requisite. Concentration of interest, perceptiveness and responsiveness to people in general, aid the salesman in perceiving cues which have a direct relationship to success in selling. Furthermore, successful salesmen maintain a high level of energy and efficiency. He thus perpetuates a rewarding environment for himself which allows him to be helpful to others. His range of interests would be practical though narrowed, and especially low in things ethical, intellectual, and aesthetic. Indeed he may be somewhat conventional.

Description of the Unsuccessful Salesman for the Firm Involved in this Study

The unsuccessful salesman in this group studied has many of the attributes of his more successful counterpart. He has, for example, a reasonable degree of social skill but is not free to fully express his potential in this regard. This may be due in part to an unfortunate self-concern which reduces his capacity for relaxed social participation and productive interaction. In addition, self-absorption may rob him of the necessary drive, energy, and decisiveness required for successful selling. Again emotional inhibition defeating his efforts toward planful, adaptive behavior would result in tension and underlying feelings of self-doubt. Intellectual efficiency would be reduced. Centering on and maintaining an interest in selling would be difficult. He would not be acutely aware of and responsive to others in a warm, outgoing fashion. Indeed, he may be somewhat detached.

CHAPTER VI

CONCLUSION

The aim of the present work was to discover whether or not certain scales on the CPI could effectively discriminate between successful and unsuccessful salesmen employed by a particular investment firm. The hypothesis was confirmed in some considerable degree. Certain additional thoughts, however, directed towards recommendations naturally emerge upon the completion of such a study.

The results have some considerable value for the company concerned. While the interpretation of the test profiles may appear to have been simplified, it is not considered feasible that this task be taken on by management personnel. An experienced interpreter is required if the individual record is to be correctly assessed in terms of the entire content and meaning of the scales, the general pattern, and the interaction of the non-significant with the significant factors. And, of course, an interpretation derives from a whole general background of psychological knowledge.

Relating more specifically to the test itself, another thought is that consideration might be given to changing some of the scale names. Certain trait descriptions now being used are not especially meaningful to business personnel. Indeed, if the CPI should become widely used in industrial selection, scale names presented in the business vocabulary would be extremely helpful.

Attention might also be profitably given to item analysis of the various scales. It would be very helpful to isolate the

predictive items, for instance, on the scales which measure social skills and other scales on which significance was found. Such analysis might be aimed at constructing a specifically designed shortened form of the inventory for use in a particular firm. Factor analysis investigations will also provide information regarding the direction in which further test construction could proceed.[1]

In addition, information derived from the test inventory might be used to advantage in designing an application form specifically related to a job situation. Such an application form could be used as a screening device preliminary to testing. Indeed, the combination of instruments used in a selection procedure should verify and complement one another.

The good results of this study have suggested the advisability of investigating the CPI profiles of prospective salesmen in terms of the total pattern as well as in relation to the six scales found to be significant. With this in mind, Figure 4[2] was drawn up to designate the area covered by the standard deviations on either side of the mean for the Top Group on the 18 scales. Obviously, gross differences in any direction should be carefully considered. Furthermore, in respect of test findings, special attention would be concentrated on the six scales found to be significant in this study as well as on the interactional aspect of Class I measures of poise, ascendancy, and self-assurance.

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1. In this respect see Mitchell and Pierce-Jones, 1960.
2. See Appendix "D".

It also seems reasonable to suggest that wider application of the test on large samples and in a variety of sales jobs would yield a valuable pool of data. As more data are accumulated, cross-validation information will become available. In the course of such research, the test itself and methods of analysis would be further refined. In addition, the validity of the CPI in multiple sales situations could be assessed.

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Appendix "A(i)"

California Psychological Inventory

HARRISON G. GOUGH, Ph.D.

DIRECTIONS:

This booklet contains a series of statements. Read each one, decide how you feel about it, and then mark your answer *on the special answer sheet.* MAKE NO MARKS ON THE TEST BOOKLET. If you *agree* with a statement, or feel that it is true about you, answer TRUE. If you *disagree* with a statement, or feel that it is not true about you, answer FALSE.

In marking your answers on the answer sheet, make sure that the number of the statement is the same as the number on the answer sheet. Be sure to answer either TRUE or FALSE for every statement, even if you have to guess at some.

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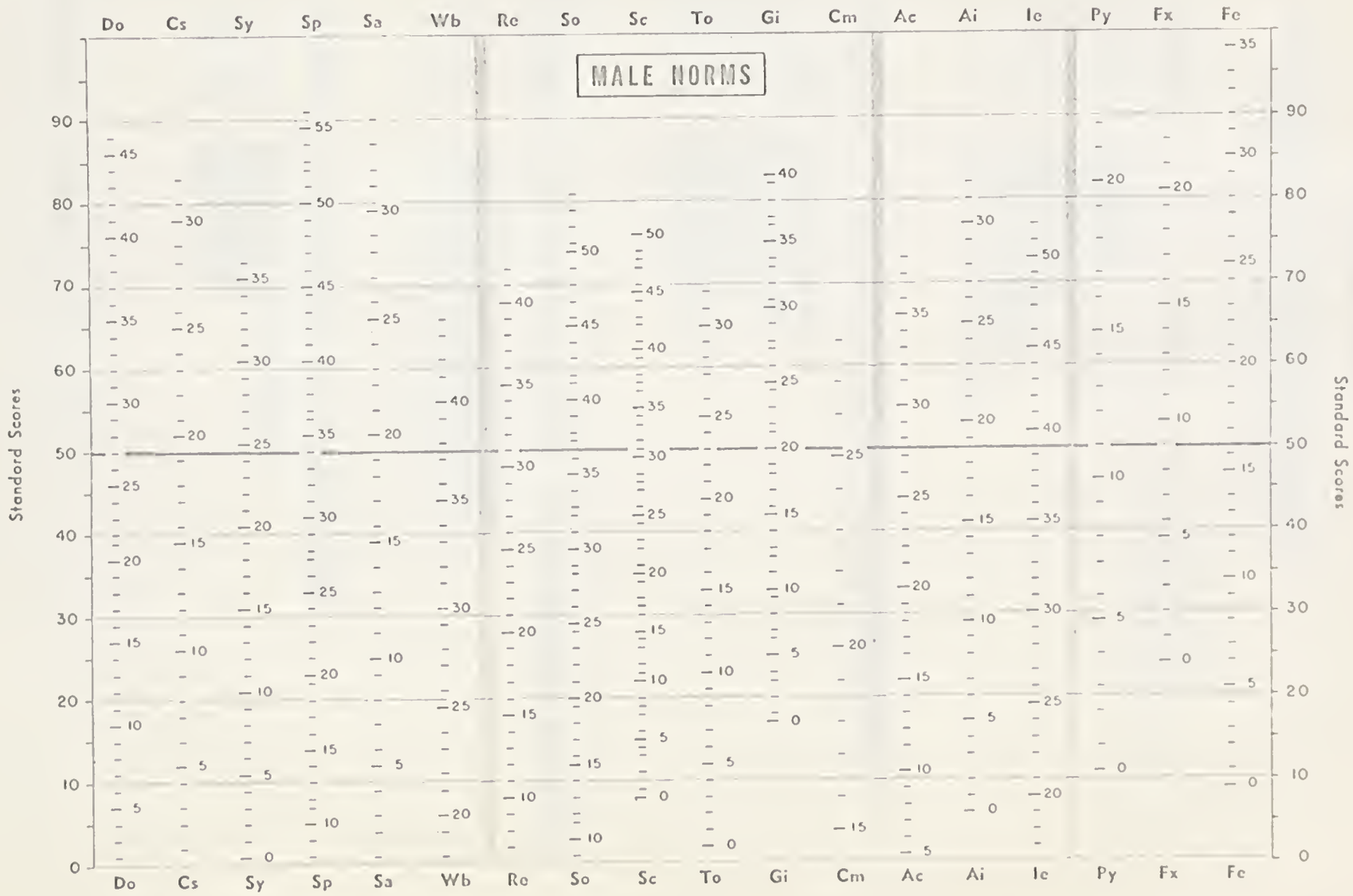
Appendix "A(ii)"

PROFILE SHEET FOR THE *California Psychological Inventory*: MALE

Name _____ Age _____ Date Tested _____

Other Information _____

Notes:



Mal. Norms

Appendix "A(iii)"

The California Psychological Inventory
Scale names and Class groupings

CLASS I. MEASURES OF POISE, ASCENDANCY, AND SELF-ASSURANCE

1. Do Dominance
2. Cs Capacity for status
3. Sy Sociability
4. Sp Social Presence
5. Sa Self-acceptance
6. Wb Sense of well-being

CLASS II. MEASURES OF SOCIALIZATION, MATURITY, AND RESPONSIBILITY

7. Re Responsibility
8. So Socialization
9. Sc Self-control
10. To Tolerance
11. Gi Good impression
12. Cm Communality

CLASS III. MEASURES OF ACHIEVEMENT POTENTIAL AND INTELLECTUAL EFFICIENCY

13. Ac Achievement via conformance
14. Ai Achievement via independence
15. Ie Intellectual efficiency

CLASS IV. MEASURES OF INTELLECTUAL AND INTEREST MODES

16. Py Psychological-mindedness
17. Fx Flexibility
18. Fe Femininity

Taken from the Manual (Gough, 1957, p. 7).

Appendix "B(i)"

Means and Standard Deviations Calculated from Raw Scores on CPI Scales

The means and standard deviations were derived separately for the Top Group and for the Bottom Group using the formulae:

Mean:

$$\bar{X} = \frac{\sum_{i=1}^{k} f_i X_i}{N}$$

Top Group N = 28

Bottom Group N = 30

Standard Deviation: obtained by taking the square root of the variance calculated from the formula:

$$S^2 = \frac{\frac{1}{N}\left[N \sum X^2 - (\sum X)^2\right]}{N-1}$$

Appendix "B(ii)"

Calculation of the Differences Between
Means on CPI Scales for Top Group
and Bottom Group

Formula:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{x}_1 - \bar{x}_2}}$$

$\bar{X}$ 1 = Top Group

$\bar{X}$ 2 = Bottom Group

Formula for obtaining unbiased estimate of the population variance:

$$S^2_{c\,combined} = \frac{\frac{1}{N_1}\left[N_1 \sum X_1^2 - \left(\sum X_1\right)^2\right] + \frac{1}{N_2}\left[N_2 \sum X_2^2 - \left(\sum X_2\right)^2\right]}{N_1 + N_2 - 2}$$

Formula for obtaining the standard error of the difference between means:

$$S_{\bar{x}_1 - \bar{x}_2} = \sqrt{S_c^2/N_1 + S_c^2/N_2}$$

NOTE: the Cochran and Cox adjustment method applied where the assumption of equality of variance was untenable.

Appendix "C"

Standard Scores for CPI Scales
and Standard Score Averages (SSA)
according to Class groupings

Class I

Scale Name	Top Group	Bottom Group	Total Group	Manual Salesmen	Bank Managers	Business Executives	Military Officers
Do	62	56	60	60	56	56	60
Cs	57	54	54	54	54	54	57
Sy	59	55	57	57	51	51	55
Sp	59	54	55	57	54	54	57
Sa	63	60	60	60	52	55	60
Wb	56	51	54	56	59	56	54
SSA	59.3	55.0	56.7	57.3	54.3	54.3	57.2

Class III

Scale Name							
Ac	55	51	53	55	58	51	53
Ai	48	48	46	48	58	53	53
Ie	54	47	49	52	54	52	54
SSA	52.3	48.6	49.3	51.6	56.6	52.0	53.3

Class IV

Scale Name							
Py	54	46	50	54	54	54	54
Fx	44	41	44	44	50	50	50
Fe	52	52	52	49	49	49	47
SSA	50.0	46.3	48.6	49.0	51.0	51.0	50.3

Class II

Scale Name	Top Group	Bottom Group	Total Group	Manual Salesmen	Bank Managers	Business Executives	Military Officers
Re	50	46	48	52	54	52	52
So	51	52	49	52	54	52	49
Sc	46	49	47	51	55	53	49
To	52	48	48	52	54	54	52
Gi	50	52	50	52	52	50	48
Cm	58	58	58	58	58	54	58
SSA	51.2	50.8	50.0	52.8	54.5	52.5	51.3

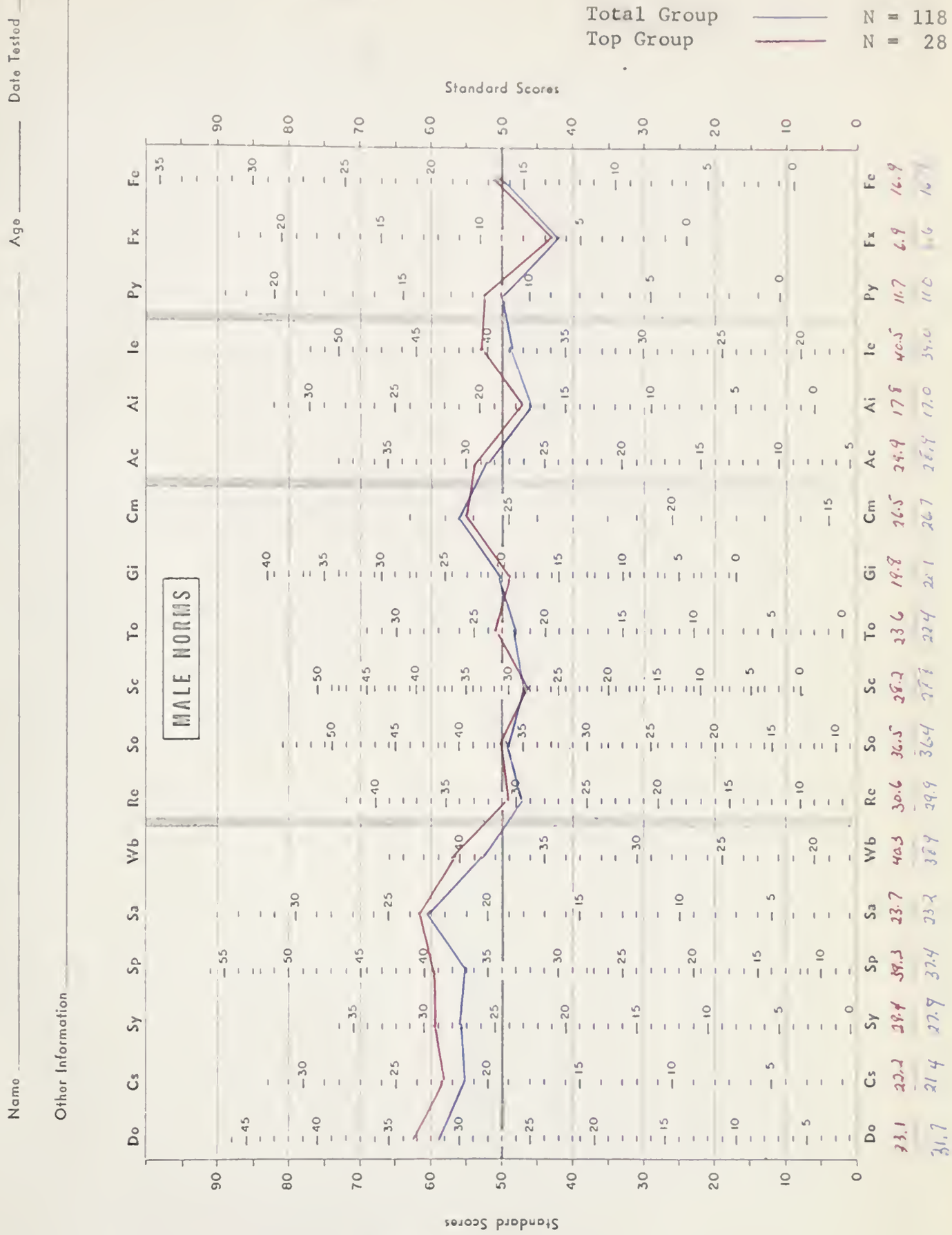
Scale Name	Prison Inmates	Young Delinquents	Psychiatric Hospital Patients
Re	32	36	44
So	35	36	45
Sc	42	43	51
To	35	35	44
Gi	43	43	52
Cm	45	49	40
SSA	38.7	40.3	46.0

NOTE: Top, Bottom, and Total Groups included in present study. See Manual (Gough, 1957, p.34) for other groups mentioned.

See Manual (Gough, 1957, p.38-39) for table converting CPI raw scores to standard scores.

Appendix "D"

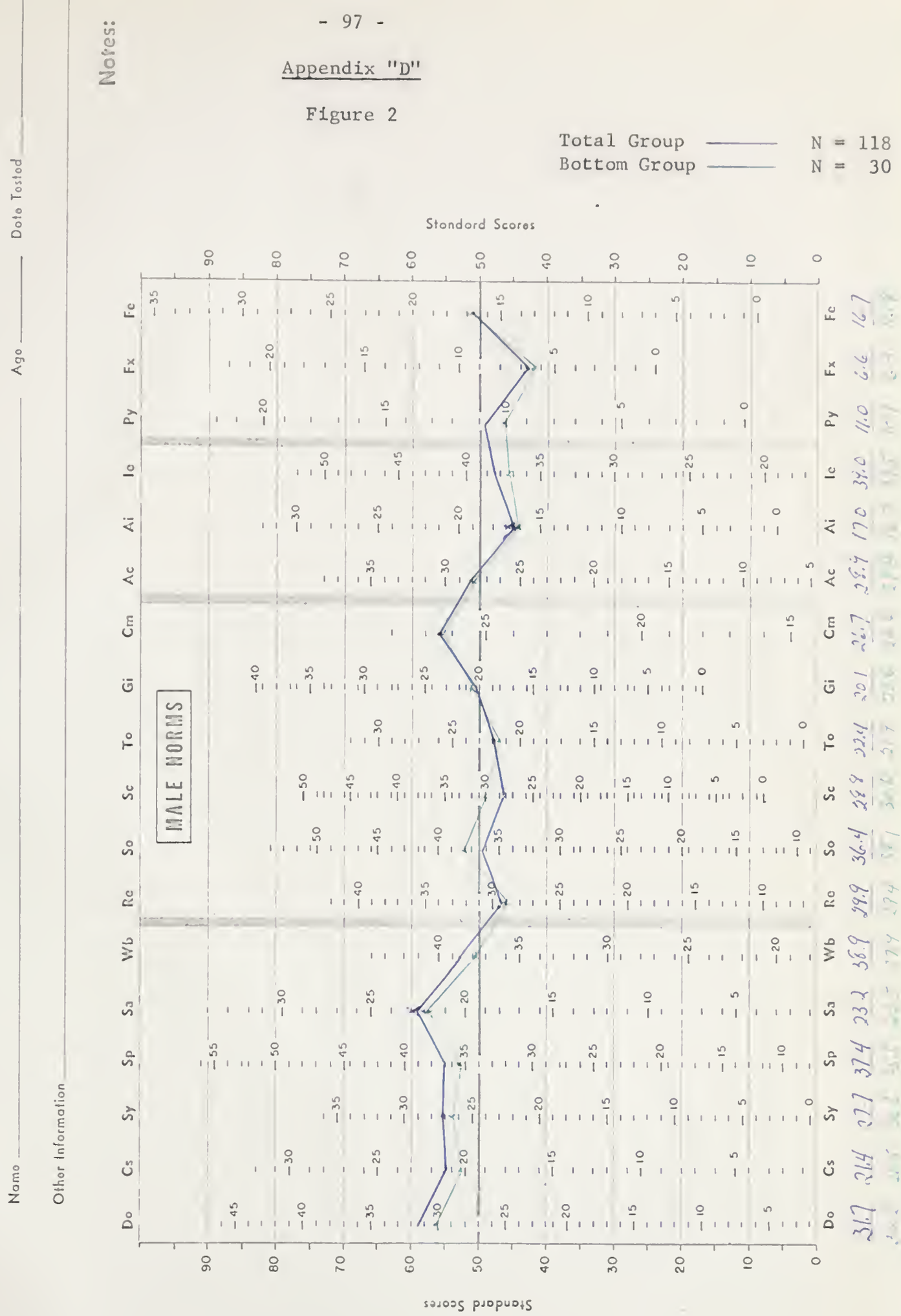
Figure 1



Profile of the Means
For Total Group and Top Group
on CPI Scales

Appendix "D"

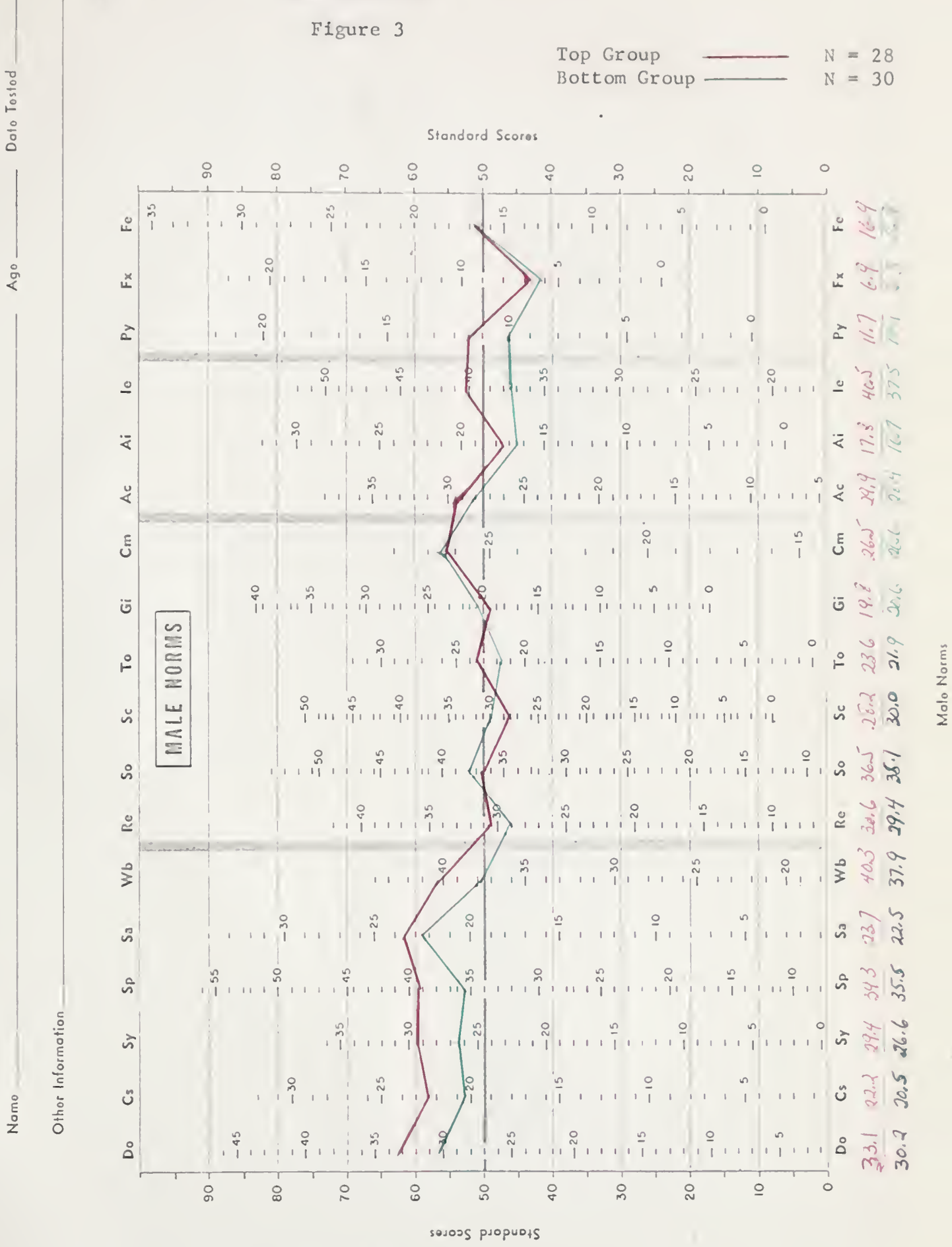
Figure 2



Profile of the Means
for Total Group and Bottom Group
on CPI Scales

Appendix "D"

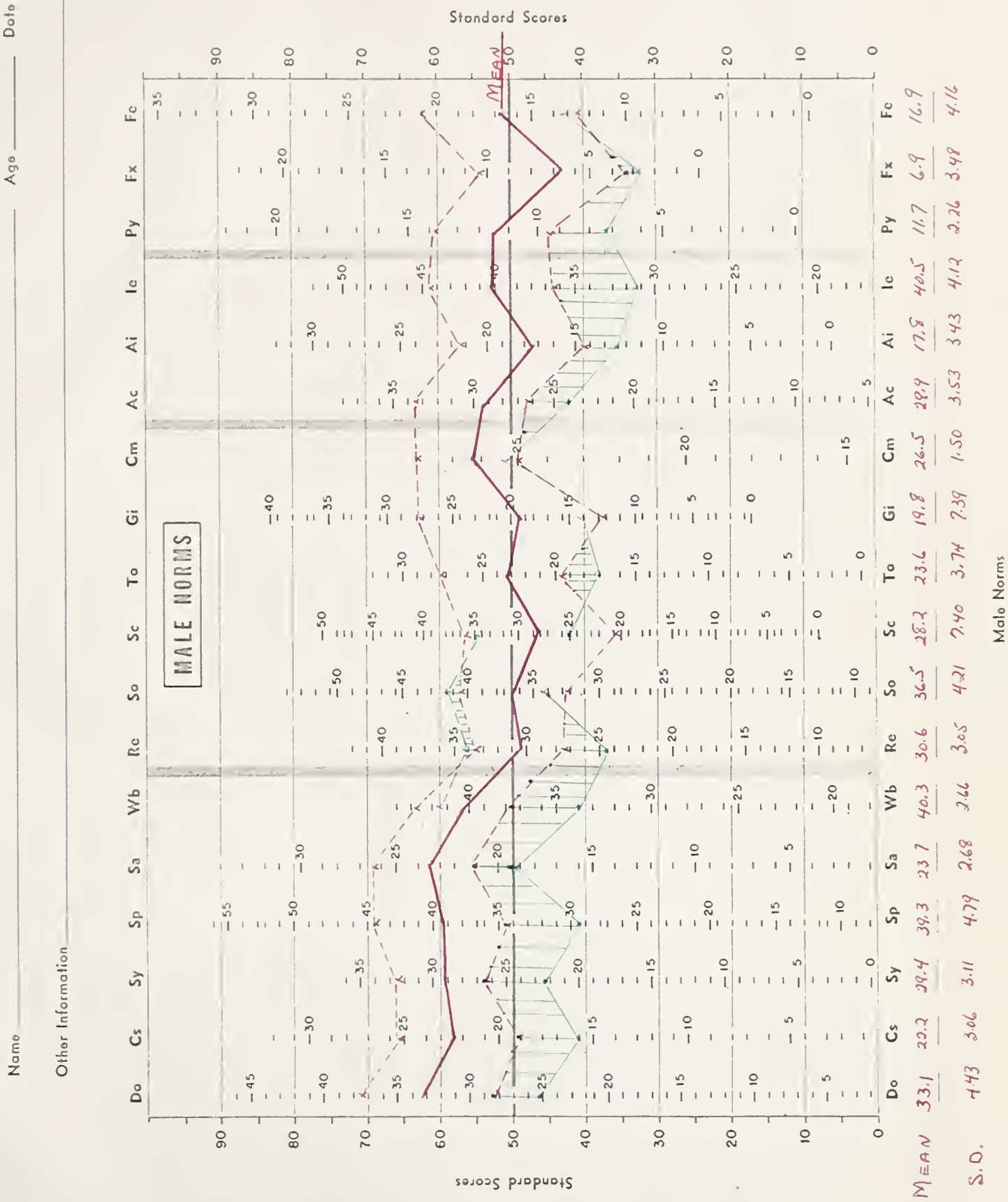
Figure 3



Profile of the Means
for Top Group and Bottom Group
on CPI Scales

Appendix "D"

Figure 4



Standard deviations on either side of the mean for the Top Group indicated in red. Standard deviations around the mean for the Bottom Group indicated in green to show comparative position.